
SPECIFICATIONS
(FOR CONSTRUCTION CONTRACT)
SOLICITATION NO. DACA45-02-B-0005

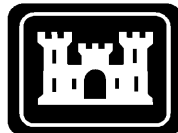
CN01 REPAIR MFH HOLLY
PHASE-1

P.N. JFS D990036

**GRAND FORKS AIR FORCE BASE,
NORTH DAKOTA**



JANUARY 2002



U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT

This page was intentionally left blank for duplex printing.

**CNO1 REPAIR MFH HOLLY PHASE-1,
GRAND FORKS AFB, ND**

PROJECT TABLE OF CONTENTS

Note:

For References herein to Sections 01000 & 01010 see Section 00800 Special Contract Requirements.

For References herein to Section “01400 - Contractor Quality Control” see Section 01451A Contractor Quality Control.

DIVISION 00 - CONTRACT REQUIREMENTS

00010 SOLICITATION, OFFER AND AWARD (SF-1442, PAGES 1 & 2)

00010 BIDDING SCHEDULE PAGES 3 & 4

00100 INSTRUCTIONS, CONDITIONS & NOTICES TO BIDDERS

00600 REPRESENTATIONS & CERTIFICATION

00700 CONTRCT CLAUSES

00800 SPECIAL CONTRACT REQUIREMENTS

ND010011 NORTH DAKOTA RESIDENTIAL WAGE DECISIONS

ND010014 NORTH DAKOTA HEAVY WAGE DECISIONS

DIVISION 01 - GENERAL REQUIREMENTS

01040 AS-BUILT DRAWINGS

01200 WARRANTY OF CONSTRUCTION

01320A PROJECT SCHEDULE

01330 SUBMITTAL PROCEDURES

E4288 SUBMITTAL REGISTER

E4025 SUBMITTAL TRANSMITTAL FORM

01355 ENVIRONMENTAL PROTECTION

01400 SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND
RENOVATION

01451A CONTRACTOR QUALITY CONTROL

DIVISION 02 - SITE WORK

02060 ASBESTOS

02061 LEAD PAINT

ALPIR ASBESTOS AND LEAD PAINT INSPECTION REPORT

02070 SELECTIVE DEMO

02100 SITE PREPARATION

02200 EARTHWORK

02500 PAVING AND SURFACING

02800 SITE IMPROVEMENTS

02936 SEEDING AND SODDING

02950 TREES AND SHRUBS

DIVISION 03 - CONCRETE

03300 CONCRETE

03930 CONCRETE MUDJACKING

DIVISION 04 - MASONRY

04200 MASONRY AND MORTAR

DIVISION 05 - METALS

05500 METAL FABRICATIONS

DIVISION 06 - WOODS & PLASTICS

06100 ROUGH CARPENTRY

06200 FINISH CARPENTRY

DIVISION 07 - THERMAL & MOISTURE PROTECTION

07210 BUILDING INSULATION

07311 ASPHALT SHINGLES

07465 SOFFIT AND TRIM

07600 FLASHING AND SHEET METAL

07900 JOINT SEALERS

DIVISION 08 - DOORS & WINDOWS

08110 STEEL CLAD DOORS AND FRAMES

08210 WOOD DOORS

08630 VINYL WINDOWS

08700 FINISH HARDWARE

DIVISION 09 - FINISHES

09260 GYPSUM BOARD SYSTEMS

09650 RESILIENT FLOORING

09680 CARPET

09900 PAINTING

DIVISION 10 - NOT USED

DIVISION 11 - EQUIPMENT

11450 RESIDENTIAL EQUIPMENT

DIVISION 12 - FURNISHINGS

12370 RESIDENTIAL CASEWORK

12492 VERTICAL LOUVER BLINDS

12510 WINDOW COVERINGS

DIVISION 13 - NOT USED

DIVISION 14 - NOT USED

DIVISION 15 - MECHANICAL

15050 BASIC MECHANICAL MATERIALS AND METHODS

15100 VALVES

15145 HANGERS AND SUPPORTS

15170 MOTORS

15260 PIPE INSULATION

15411 WATER DISTRIBUTION PIPING

15420 DRAINAGE AND VENT PIPING

15430 PLUMBING SPECIALTIES

15440 PLUMBING FIXTURES

15452 SUMP PUMPS

15496 NATURAL GAS PIPING

15671 CONDENSING UNITS

15853 POWER VENTILATORS

15855 REGISTERS AND GRILLES

15891 METAL DUCTWORK

15910 DUCT ACCESSORIES

15990 TESTING, ADJUSTING, AND BALANCING

DIVISION 16 - ELECTRICAL

16050 BASIC ELECTRICAL MATERIALS AND METHODS

16110 RACEWAYS AND FITTINGS

16119 UNDERGROUND DUCTS AND TRANSFORMER BOXES

16120 WIRES AND CABLES

16121 CONTROL SYSTEM TRANSMISSION MEDIA

16124 MEDIUM-VOLTAGE CABLES

16135 CABINETS, BOXES AND FITTINGS

16143 WIRING DEVICES AND OTHER INTERIOR DEVICES AND SYSTEMS

16170 CIRCUIT AND MOTOR DISCONNECTS

16190 SUPPORTING DEVICES

16195 ELECTRICAL IDENTIFICATION

16321 SINGLE PHASE PAD-MOUNTED TRANSFORMERS

16322 MEDIUM-VOLTAGE SECTIONALIZING CABINET

16370 OVERHEAD ELECTRICAL WORK

16452 GROUNDING

16470 PANELBOARDS

PROJECT TABLE OF CONTENTS Page 2

CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND GF85

16512 EXTERIOR LIGHTING FIXTURES

16515 INTERIOR LIGHTING FIXTURES

-- End of Project Table of Contents --

This page was intentionally left blank for duplex printing.

SOLICITATION, OFFER, AND AWARD (Construction, Alteration, or Repair)	1. SOLICITATION NO.	2. TYPE OF SOLICITATION	3. DATE ISSUED	PAGE OF PAGES
	DACA45-02-B-0005	<input checked="" type="checkbox"/> SEALED BID (IFB) <input type="checkbox"/> NEGOTIATED (RFP)	15 JAN 2002	1 OF 4

IMPORTANT - The "offer" section on the reverse must be fully completed by offeror.

4. CONTRACT NO.		5. REQUISITION/PURCHASE REQUEST NO.	6. PROJECT NO.
7. ISSUED BY	CODE	8. ADDRESS OFFER TO	
	CT		
U.S. ARMY ENGINEER DISTRICT, OMAHA 106 South 15th Street Omaha, Nebraska 68102-1618		U.S. ARMY CORPS OF ENGINEERS, OMAHA Attn: CONTRACTING DIVISION (CENWO-CT) 106 South 15th Street Omaha, Nebraska 68102-1618	
9. FOR INFORMATION CALL:	A. NAME	B. TELEPHONE NO. (Include area code) (NO COLLECT CALLS)	
	See SECTION 00100, Para. 24	See SECTION 00100, Para. 24	

SOLICITATION

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder".

10. THE GOVERNMENT REQUIRES PERFORMANCE OF THE WORK DESCRIBED IN THESE DOCUMENTS (Title, identifying no., date):

The Offeror hereby agrees to do all the work described in these documents entitled:

CN01 REPAIR MFH HOLLY PHASE-1
 PN JFS D990036
 GRAND FORKS AFB, NORTH DAKOTA

RETURN WITH BID: SECTION 00010 (SF1442), SECTION 00600 AND BID GUARANTEE

OTHER BONDING INFORMATION: SEE SECTION 00700, CONTRACT CLAUSES CLAUSE "FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS".

11. The Contractor shall begin performance within <u>10</u> calendar days and complete it within <u>540</u> calendar days after receiving	
<input type="checkbox"/> award, <input checked="" type="checkbox"/> notice to proceed. This performance period is <input checked="" type="checkbox"/> mandatory, <input type="checkbox"/> negotiable. (See _____.)	
12A. THE CONTRACTOR MUST FURNISH ANY REQUIRED PERFORMANCE AND PAYMENT BONDS? (If "YES," indicate within how many calendar days after award in Item 12B.)	12B. CALENDAR DAYS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10

13. ADDITIONAL SOLICITATION REQUIREMENTS:

- A. Sealed offers in original and 0 copies to perform the work required are due at the place specified in Item 8 by 1400 (hour) local time 21 FEB 2002 (date). If this is a sealed bid solicitation, offers must be publicly opened at that time. Sealed envelopes containing offers shall be marked to show the offeror's name and address, the solicitation number, and the date and time offers are due.
- B. An offer guarantee ☒ is, ☐ is not required.
- C. All offers are subject to the (1) work requirements, and (2) other provisions and clauses incorporated in the solicitation in full text or by reference.
- D. Offers providing less than 60 calendar days for Government acceptance after the date offers are due will not be considered and will be rejected.

14. NAME AND ADDRESS OF OFFEROR (Include ZIP Code) <div style="color: blue; font-weight: bold;">DUNS Number:</div>				15. TELEPHONE NO. (Include area code) 16. REMITTANCE ADDRESS (Include only if different than Item 14)			
CODE		FACILITY CODE					
17. The offeror agrees to perform the work required at the prices specified below in strict accordance with the terms of this solicitation, if this offer is accepted by the Government in writing within <u>60</u> calendar days after the date offers are due. (Insert any number equal to or greater than the minimum requirement stated in Item 13D. Failure to insert any number means the offeror accepts the minimum in Item 13D.)							
AMOUNTS		<div style="color: blue; font-weight: bold;">SEE ATTACHED BIDDING SCHEDULE, PAGE 00010-3</div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> Contractor's Fax No. _____ CAGE Code _____ </div> <div style="margin-top: 5px;"> Contractor's E-Mail address _____ </div>					
18. The offeror agrees to furnish any required performance and payment bonds.							
19. ACKNOWLEDGMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the solicitation - give number and date of each)							
AMENDMENT NO.							
DATE							
20A. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)				20B. SIGNATURE		20C. OFFER DATE	
AWARD (To be completed by Government)							
21. ITEMS ACCEPTED:							
22. AMOUNT				23. ACCOUNTING AND APPROPRIATION DATA			
24. SUBMIT INVOICES TO ADDRESS SHOWN IN (4 copies unless otherwise specified)			ITEM <div style="color: blue; font-weight: bold;">26</div>	25. OTHER THAN FULL AND OPEN COMPETITION PURSUANT TO <div style="display: flex; justify-content: space-between;"> <input type="checkbox"/> 10 U.S.C. 2304(c) () <input type="checkbox"/> 41 U.S.C. 253(c) () </div>			
26. ADMINISTERED BY <div style="color: blue; font-weight: bold;">U.S. Army Engineer District, Omaha</div> <div style="color: blue; font-weight: bold;">106 South 15th Street</div> <div style="color: blue; font-weight: bold;">Omaha, Nebraska 68102-1618</div>			27. PAYMENT WILL BE MADE BY <div style="color: blue; font-weight: bold;">USAED Omaha</div> <div style="color: blue; font-weight: bold;">c/o USACE Finance Center</div> <div style="color: blue; font-weight: bold;">5722 Integrity Drive</div> <div style="color: blue; font-weight: bold;">Millington, TN 38054-5005</div>				
CONTRACTING OFFICER WILL COMPLETE ITEM 28 OR 29 AS APPLICABLE							
<input type="checkbox"/> 28. NEGOTIATED AGREEMENT (contractor is required to sign this document and return _____ copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all work, requisitions identified on this form and any continuation sheets for the consideration stated in this contract. The rights and obligations of the parties to this contract shall be governed by (a) this contract award, (b) the solicitation, and (c) the clauses, representations, certifications, and specifications incorporated by reference in or attached to this contract.				<input type="checkbox"/> 29. AWARD (Contractor is not required to sign this document.) Your offer on this solicitation, is hereby accepted as to the items listed. This award consummates the contract, which consists of (a) the Government solicitation and your offer, and (b) this contract award. No further contractual document is necessary.			
30A. NAME AND TITLE OF CONTRACTOR OR PERSON AUTHORIZED TO SIGN (Type or print)				31A. NAME OF CONTRACTING OFFICER (Type or print)			
30B. SIGNATURE		30C. DATE		31B. UNITED STATES OF AMERICA BY		31C. AWARD DATE	

BIDDING SCHEDULE

BASIC

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ESTIMATED QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>AMOUNT</u>
0001	Entire work complete for “whole house” repairs (12 three bedroom units converted to 2BR located in 6 single-story duplex buildings (Bldg. #s 1911, 1909,1905,1899,1893,1891)	XXX	JOB	L.S.	\$_____
0002	Entire work complete for “whole house” repairs (12 three bedroom units converted to 2BR located in 6 two-story duplex buildings (Bldg. #s 1913,1907,1901,1897, 1895,1889)	XXX	JOB	L.S.	\$_____
0003	Entire Work Complete for Primary Electrical Service	XXX	JOB	L.S.	\$_____
TOTAL (BASIC)					\$_____

OPTIONS

O-0001	Entire Work Complete for “whole house” repairs (1 three bedroom unit converted to 2BR located in 1 single-story duplex building (Bldg. # 1887)	XXX	JOB	L.S.	\$_____
O-0002	Entire Work Complete for “whole house” repairs (1 three bedroom unit converted to 2BR located in 1 single-story duplex building (Bldg. # 1885)	XXX	JOB	L.S.	\$_____
O-0003	Entire Work Complete for “whole house” repairs (1 three bedroom unit converted to 2BR located in 1 two-story duplex building (Bldg. # 1883)	XXX	JOB	L.S.	\$_____
GRAND TOTAL (BASIC + OPTIONS)					\$_____

NOTES:

1. See SECTION 00100, INSTRUCTIONS, CONDITIONS, & NOTICES TO BIDDERS for evaluation of options. The Government reserves the right to exercise the options within 210 days after issuance of Notice to Proceed.
2. Bid prices must be entered for all items of the schedule. Total amount bids submitted without bid prices being entered on individual items will be rejected. Additions will be subject to verification by the Government. In case of variation between the lump-sum prices and the total amount, the lump-sum prices will be considered the bid.
3. A modification to a bid, which provides for a single adjustment to the total amount bid, should state the application of the adjustment to each respective lump-sum price affected. If the modification is not so apportioned, a pro rata adjustment will be applied to Basic Item Nos. 0001, 0002 and 0003.

SECTION 00100

INSTRUCTIONS, CONDITIONS & NOTICES TO BIDDERS
(July 2000, Revised November 2001)

INDEX

ATTACHMENTS: REQUIRED CENTRAL CONTRACTOR REGISTRATION

1	GENERAL BIDDING INFORMATION	3
1.1	MAILED BIDS AND HAND-CARRIED BIDS.....	3
1.2	SOLICITATION RESTRICTIONS	3
1.3	BASIS FOR AWARD.....	3
1.4	DESCRIPTION OF WORK.....	3
1.5	ESTIMATED CONSTRUCTION COST.....	3
2	(FAR 52.214-6) EXPLANATION TO PROSPECTIVE BIDDERS (APRIL 1984).	3
3	(FAR 52.214-1) SOLICITATION DEFINITIONS - SEALED BIDDING (JULY 1987).....	4
4	(FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990).....	4
5	OPTIONS.....	4
6	(FAR 52.214-5) SUBMISSION OF BIDS (MAR 1997).	4
7	(FAR 52.214-18) PREPARATION OF BIDS - CONSTRUCTION (APRIL 1984).....	5
8	(FAR 52.214-4) FALSE STATEMENTS IN BIDS (APRIL 1984).....	5
9	(FAR 52.214-7) LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999).....	5
10	INFORMATION FOR MODIFYING BIDS.....	6
11	BID GUARANTEE.....	7
12	PERFORMANCE AND PAYMENT BONDS.	7
13	(FAR 52.214-19) CONTRACT AWARD - SEALED BIDDING - CONSTRUCTION (AUG 1996).	7
14	NORTH AMERICAN CLASSIFICATION SYSTEM (NAICS).....	7
15	SMALL BUSINESS SIZE STANDARD.....	8
16	(FAR 52.214-3) AMENDMENTS TO INVITATIONS FOR BIDS (DECEMBER 1989).	8
17	CHANGES PRIOR TO OPENING BIDS.	8

18	(FAR 52.214-34) SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)	8
19	(FAR 52.214-35) SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)	8
20	AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.....	8
20.1	(FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999).	9
20.2	CORPS OF ENGINEERS SPECIFICATIONS	9
20.3	COMMERCIAL (NON-GOVERNMENT) SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.	9
21	AVAILABLE PLANT.....	9
22	EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE.	9
23	NOTICE REGARDING BUY AMERICAN ACT.....	10
24	TAXES - NORTH DAKOTA.....	10
24.1	UNEMPLOYMENT TAX SURCHARGE.....	10
24.2	USE TAX.	11
25	(FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).....	11
26	BIDDER'S QUESTIONS AND COMMENTS.....	11
26.1	PLAN HOLDER'S LIST.	12
26.2	AVAILABILITY OF BID RESULTS (LOCAL CLAUSE/PROVISION).....	12
27	(FAR 52.233-2) SERVICE OF PROTEST (AUG 1996).....	12
28	PRE-AWARD SURVEY INFORMATION (LOCAL PROVISION) (SEP 93)	13
29	(FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)	13
30	(FAR 52.216-1) TYPE OF CONTRACT (APR 1984).....	14
31	SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS.	14
32	(DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001) ...	16

SECTION 00100

INSTRUCTIONS, CONDITIONS & NOTICES TO BIDDERS

1 GENERAL BIDDING INFORMATION

Bids shall be either mailed or hand-carried as indicated below. Bid will be PUBLICLY opened at the bid time indicated on Standard Form SF 1442 (Page 00010-1).

1.1 MAILED BIDS AND HAND-CARRIED BIDS

Mailed bids shall be addressed to the location as indicated on Standard Form SF 1442 (Page 00010-1), Item No. 8.

Hand-Carried bids shall be delivered to the U.S. Army Engineer District, Omaha to Contracting Division, Room 301, 106 South 15th Street, Omaha, NE 68102-1618.

1.2 SOLICITATION RESTRICTIONS

This solicitation is unrestricted and open to both large and small business participation.

1.3 BASIS FOR AWARD.

IT IS INTENDED THAT AWARD WILL BE MADE TO ONE BIDDER FOR THE ENTIRE WORK.

1.4 DESCRIPTION OF WORK

The work consists of furnishing all plant, labor, materials, and equipment and performing all incidental and necessary work to complete CN01 REPAIR MFH HOLLY PHASE-1 at GRAND FORKS AFB, ND, in accordance with the plans and specifications.

1.5 ESTIMATED CONSTRUCTION COST

The estimated construction cost of this project is between \$1,000,000 and \$2,500,000.

2 (FAR 52.214-6) EXPLANATION TO PROSPECTIVE BIDDERS (APRIL 1984).

Any prospective bidder desiring an explanation or interpretation of the solicitation, drawings, specifications, etc., must request it in writing soon enough to allow a reply to reach all prospective bidders before the submission of their bids. Oral explanations or instructions given before the award of a contract will not be binding. Any information given a prospective

bidder concerning a solicitation will be furnished promptly to all other prospective bidders as an amendment to the solicitation, if that information is necessary in submitting bids or if the lack of it would be prejudicial to other prospective bidders.

3 (FAR 52.214-1) SOLICITATION DEFINITIONS - SEALED BIDDING (JULY 1987) .

"Government" means United States Government. "Offer" means "bid" in sealed bidding. "Solicitation" means an invitation for bids in sealed bidding. (FAR 52.214-1.)

(NOTE: FACSIMILE, ELECTRONIC COMMERCE OR TELEGRAPHIC BIDS ARE NOT AUTHORIZED AND WILL NOT BE ACCEPTED. TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS ARE AUTHORIZED. FACSIMILE MODIFICATIONS OR WITHDRAWAL ARE NOT AUTHORIZED.)

4 (FAR 52.217-5) EVALUATION OF OPTIONS (JUL 1990) .

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

5 OPTIONS .

The Government may reject an offer as nonresponsive if it is materially unbalanced as to prices for the basic requirement and the option quantities. An offer is unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated for other work.

6 (FAR 52.214-5) SUBMISSION OF BIDS (MAR 1997) .

(a) Bids and bid modifications shall be submitted in sealed envelopes or packages (unless submitted by electronic means) (1) addressed to the office specified in the solicitation and (2) showing the time and date specified for receipt, the solicitation number, and the name and address of the bidder.

(b) Bidders using commercial carrier services shall ensure that the bid is addressed and marked on the outermost envelope or wrapper as prescribed in subparagraphs (a) (1) and (2) of this provision when delivered to the office specified in the solicitation.

(c) Telegraphic bids will not be considered unless authorized by the solicitation; however, bids may be modified or withdrawn by written or telegraphic notice.

(d) Facsimile bids, modifications, or withdrawals, will not be

considered unless authorized by the solicitation

(e) Bids submitted by electronic commerce shall be considered only if the electronic commerce method was specifically stipulated or permitted by the solicitation.

7 (FAR 52.214-18) PREPARATION OF BIDS - CONSTRUCTION (APRIL 1984).

(a) Bids must be--

- (1) Submitted on the forms furnished by the Government or on copies of those forms, and
- (2) **Manually signed.** The person signing a bid must initial each erasure or change appearing on any bid form.

(b) The bid form may require bidders to submit bid prices for one or more items on various bases, including--

- (1) Lump sum bidding;
- (2) Alternate prices;
- (3) Units of construction; or
- (4) Any combination of subparagraphs (1) through (3) above.

(c) If the solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "no bid" in the space provided for any item on which no price is submitted.

(d) Alternate bids will not be considered unless this solicitation authorizes their submission.]

8 (FAR 52.214-4) FALSE STATEMENTS IN BIDS (APRIL 1984).

Bidders must provide full, accurate, and complete information as required by this solicitation and its attachments. The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

(NOTE: FACSIMILE, ELECTRONIC COMMERCE OR TELEGRAPHIC BIDS ARE NOT AUTHORIZED AND WILL NOT BE ACCEPTED. TELEGRAPHIC MODIFICATIONS OR WITHDRAWAL OF BIDS ARE AUTHORIZED. FACSIMILE MODIFICATIONS OR WITHDRAWAL ARE NOT AUTHORIZED.)

9 (FAR 52.214-7) LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF BIDS (NOV 1999).

(a) Bidders are responsible for submitting bids, and any modifications

or withdrawals, so as to reach the Government office designated in the invitation for bids (IFB) by the time specified in the IFB. If no time is specified in the IFB, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that bids are due.

(b) (1) Any bid, modification, or withdrawal received at the Government office designated in the IFB after the exact time specified for receipt of bids is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late bid would not unduly delay the acquisition; and--

(i) If it was transmitted through an electronic commerce method authorized by the IFB, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of bids; or

(ii) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of bids and was under the Government's control prior to the time set for receipt of bids.

(2) However, a late modification of an otherwise successful bid that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(c) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the bid wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(d) If an emergency or unanticipated event interrupts normal Government processes so that bids cannot be received at the Government office designated for receipt of bids by the exact time specified in the IFB and urgent Government requirements preclude amendment of the IFB, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(e) Bids may be withdrawn by written notice received at any time before the exact time set for receipt of bids. If the IFB authorizes facsimile bids, bids may be withdrawn via facsimile received at any time before the exact time set for receipt of bids, subject to the conditions specified in the provision at 52.214-31, Facsimile Bids. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for receipt of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.
(End of provision)

10 INFORMATION FOR MODIFYING BIDS.

Bids which have been delivered to the designated bid receiving office may be modified or withdrawn by mail, mailgram, or telegram received at any time before the exact time set for receipt of bids. Modifications or withdrawals sent by mail should be transmitted to the place of bid opening Standard Form SF1442 (Page 00010-1), Item 8. Telephone modifications or withdrawals, other than telecopier, will not be accepted. All bid modifications or withdrawals must be signed by the bidder or its authorized representative. Any questions regarding these procedures should be directed to the Omaha District's

Contracting Division at (402) 221-4265 or 4824. This number should also be used to verify the receipt of messages.

11 BID GUARANTEE.

See Contract Clauses clause FAR 52.228-1, BID GUARANTEE. Bid guarantee MUST be in an original and accompanied by an original power of attorney of the surety.

12 PERFORMANCE AND PAYMENT BONDS.

See Contract Clauses clause FAR 52.228-15, PERFORMANCE AND PAYMENT BONDS. To have the bond considered valid, both the bond and the Power of Attorney must be original. Facsimile copies will not be acceptable, and will render the bid invalid, therefore eliminating it from competition.

(NOTE: FOR THE PURPOSES OF THIS SOLICITATION, THE WORD "ITEM" SHALL BE CONSIDERED TO MEAN "SCHEDULE.")

13 (FAR 52.214-19) CONTRACT AWARD - SEALED BIDDING - CONSTRUCTION (AUG 1996).

(a) The Government will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the Government, considering only price and the price-related factors specified elsewhere in the solicitation.

(b) The Government may reject any or all bids, and waive informalities or minor irregularities in bids received.

(c) The Government may accept any item or combination of items, unless doing so is precluded by a restrictive limitation in the solicitation of the bid.

(d) The Government may reject a bid as nonresponsive if the prices bid are materially unbalanced between line items or subline items. A bid is materially unbalanced when it is based on prices significantly less than cost for some work, and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the Government even though it may be the low evaluated bid, of it is so unbalanced as to be tantamount to allowing an advance payment.

14 NORTH AMERICAN CLASSIFICATION SYSTEM (NAICS).

In accordance with NAICS Manual, the work in this solicitation is assigned classification code 23322, Multifamily Housing Construction.

15 SMALL BUSINESS SIZE STANDARD.

This solicitation is not limited to small business concerns, for definition purposes, a concern is small if its average annual receipts for its preceding 3 fiscal years did not exceed \$27.5 million. (based on FAR 19.102)

16 (FAR 52.214-3) AMENDMENTS TO INVITATIONS FOR BIDS (DECEMBER 1989) .

- (a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.
- (b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date in the space provided for this purpose on the form for submitting a bid, (3) by letter or telegram or (4) by facsimile, if facsimile bids are authorized in the solicitation. The Government must receive the acknowledgment by the time and at the place specified for receipt of bids. (FAR 52.214-3.)

17 CHANGES PRIOR TO OPENING BIDS.

The right is reserved, as the interest of the Government may require, to revise the specifications and/or drawings prior to the date set for opening bids. Such revisions will be announced by an amendment or amendments to this Invitation for Bids. It shall be the responsibility of the prospective bidder to obtain copies of amendments from the website listed in paragraph: PLAN HOLDER'S LIST below. The Government may (but not required) send an amendment notification to let prospective bidders know that an amendment has been issued.] If the revisions and amendments are of a nature which requires material changes in quantities or prices to be bid, the date set for opening bids may be postponed as necessary, in the opinion of the Commander, to enable bidders to revise their bids. In such cases, the amendment will include an announcement of the new date for opening bids.

18 (FAR 52.214-34) SUBMISSION OF OFFERS IN THE ENGLISH LANGUAGE (APR 1991)

Offers submitted in response to this solicitation shall be in the English language. Offers received in other than English shall be rejected.

(End of provision)

19 (FAR 52.214-35) SUBMISSION OF OFFERS IN U.S. CURRENCY (APR 1991)

Offers submitted in response to this solicitation shall be in terms of U.S. dollars. Offers received in other than U.S. dollars shall be rejected.

(End of provision)

20 AVAILABILITY OF SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.

Specifications, standards, and descriptions cited in this solicitation are available as indicated below:

20.1 (FAR 52.211-2) AVAILABILITY OF SPECIFICATIONS LISTED IN THE DOD INDEX OF SPECIFICATIONS AND STANDARDS (DODISS) AND DESCRIPTIONS LISTED IN THE ACQUISITION MANAGEMENT SYSTEMS AND DATA REQUIREMENTS CONTROL LIST, DOD 5010.12-L (DEC 1999) .

Copies of specifications, standards, and data item descriptions cited in this solicitation may be obtained—

- (a) From the ASSIST database via the Internet at <http://assist.daps.mil>; or
- (b) By submitting a request to the—

Department of Defense Single Stock Point (DoDSSP)
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5094
Telephone (215) 697-2667/2179
Facsimile (215) 697-1462.

(End of provision)

20.2 CORPS OF ENGINEERS SPECIFICATIONS.

Corps of Engineers specifications of the CRD-C series may be obtained from the National Institute of Building Sciences Construction Criteria Base (CCB) on CD-ROM. Contact the CCB directly at (202) 289-7800 for an order form or obtain an order form at the following internet address:
<http://www.ccb.org/ccbsubscribe/Subsmain.asp>. There is a regular annual subscription fee to CCB of \$700 per year. (Note: This is considered to be the Contractor's responsibility and cost). This will include CCB on CD-ROM or DVD plus unlimited internet access plus access to the new Whole Building Design Guide, now under construction and scheduled for launch in October 2001. Selected Corps of Engineers specifications of CRD-C series are available in Acrobat Reader .pdf file format at the following internet address:
<http://www.wes.army.mil/SL/MTC/handbook/handbook.htm>.

20.3 COMMERCIAL (NON-GOVERNMENT) SPECIFICATIONS, STANDARDS, AND DESCRIPTIONS.

These specifications, standards, and descriptions are not available from Government sources. They may be obtained from the publishers.

21 AVAILABLE PLANT.

Each bidder shall, upon request of the Contracting Officer, furnish a list of the plant available to the bidder and proposed for use on the work.

22 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE.

Whenever a contract or modification of contract price is negotiated, the Contractor's cost proposals for equipment ownership and operating expenses shall be determined in accordance with the requirements of paragraph: EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE, contained in Section: 00800, SPECIAL CONTRACT REQUIREMENTS of the specifications. A copy of EP 1110-1-8 "Construction Equipment Ownership and Operating Expense Schedule" is available for review at the office listed in paragraph: SITE VISIT (CONSTRUCTION) herein or at the following internet address: <http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm>. (copy also included on CD-ROM issued with this solicitation). .

23 NOTICE REGARDING BUY AMERICAN ACT.

The Buy American Act (41 U.S.C. 10a-10d) generally requires that only domestic construction material be used in the performance of this contract. Exception from the Buy American Act shall be permitted only in the case of nonavailability of domestic construction materials. A bid or proposal offering nondomestic construction material will not be accepted unless specifically approved by the Government. When a bidder or offeror proposes to furnish nondomestic construction material, his bid or proposal must set forth an itemization of the quantity, unit price, and intended use of each item of such nondomestic construction material. When offering nondomestic construction material pursuant to this paragraph, bids or proposals may also offer, at stated prices, any available comparable domestic construction material, so as to avoid the possibility that failure of a nondomestic construction material to be acceptable under this paragraph will cause rejection of the entire bid. All bidders are cautioned that, prior Government conduct notwithstanding, the Contractor's selection of a domestic construction material (as defined in FAR 52.225-5 Buy American Act-Construction Materials) which would require the subsequent selection of a foreign construction material for compatibility is not a justification for waiver of the Buy American Act. It is the Contractor's responsibility to verify, prior to submitting the materials for approval, that each system can be built to meet the contract specifications without the use of foreign construction materials.

24 TAXES - NORTH DAKOTA.

24.1 UNEMPLOYMENT TAX SURCHARGE.

The State of North Dakota has enacted legislation applicable to certain some contractors concerning an unemployment tax surcharge. See the North Dakota Century Code, Section 52-04-06.1, Incremental Bond for Impact Projects. The law provides for an unemployment tax surcharge in addition to regular unemployment tax liability. Bidders should investigate the effect, if any, that this law may have upon their bid prices. Inquiries should be directed to Job Service of North Dakota, Post Office Box 1537, Bismarck, North Dakota 58502. Telephone: (701) 224-3470 (Department of Revenue).

24.2 USE TAX.

Bidders are advised of the possible applicability of North Dakota Use Tax. Government furnished Construction material used by the Contractor may be subject to Use Tax. The value of material furnished is set forth in the SECTION 00800, SPECIAL CONTRACT REQUIREMENTS Clause "Government-Furnished Property." Specific inquiries as to the applicability of North Dakota Use Tax should be referred to the North Dakota State Tax Commission.

25 (FAR 52.236-27) SITE VISIT (CONSTRUCTION) (FEB 1995).

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) Contractors interested in inspecting the site of the proposed work should contact the Grand Forks Resident Engineer, U.S. Army Corps of Engineers, P.O. Box 247, Emerado, North Dakota 58228 for mail and 558 Eielson Street, Bldg. 440 for site inspection, Telephone: (701) 594-5016/5575.

26 BIDDER'S QUESTIONS AND COMMENTS.

Questions and/or comments relative to these bidding documents should be submitted via e-mail or mailed to the address identified in paragraph: AVAILABILITY OF BID RESULTS below. Comments should reach this office no later than 20 calendar days prior to the date set for opening of bids, if feasible, in order that changes, if needed, may be added by amendment. E-mail addresses, FAX numbers, items for question and points of contact are listed below. Phone calls with questions should be made between 8:30 a.m. and 3:30 p.m. (Central Standard Time) Monday through Friday.

Note: A courtesy copy of all questions shall be sent to the Contract Specialist (Contractual Matters Point of Contact), the Program Manager and Specifications Section (Technical Content Points of Contact).

<u>Items for Question</u>	<u>Points of Contact/ Phone numbers/ FAX Numbers</u>	<u>E-mail Addresses</u>
Contractual Matters:	Kevin McElroy	kevin.p.mcelroy@usace.army.mil
Ordering CD-Rom of	402-221-4265 or 4824 (phone)	
the plans and	402-221-4199 (Fax)	
specifications		
(limit One per firm)/		
amendments**/		
Bid Results (See		
Paragraph AVAILABILITY		
OF BID RESULTS, below)/		

Receipt of Bids

Planholder's List	See paragraph: PLAN HOLDER'S LIST, below.
Small Business Matters	Hubert Carter hubert.j.carter@usace.army.mil 402-221-4110 (phone)
Technical Contents Of Plans and Specification	Larry Brigewatt larry.g.bringewatt@usace.army.mil 402-221-3806 (phone) 402-221-4828 (Fax)
	Or
	Specifications michael.r.pisci@usace.army.mil Section Michael Pisci 402-221-4413 (Phone) 402-221-3842 (Fax)
Site Inspection	See Paragraph: SITE VISIT (CONSTRUCTION), above

**** - The Government may elect to send a notification that an amendment has been posted to the Government's web address. It shall be the Contractor's, Subcontractor's and Supplier's responsibility to check the Government's web address for amendments.**

26.1 PLAN HOLDER'S LIST.

The CD-Rom will provide a list of plan holders that have registered at the time the CD-Rom was created. It is bidder's responsibility to check for any updates to the plan holder's list, which is available at the following web address:

<http://ebs.nwo.usace.army.mil>

26.2 AVAILABILITY OF BID RESULTS (Local Clause/Provision)

Bid results will be available after bid opening on the Government's web address:
<http://ebs.nwo.usace.army.mil/ebs/contract.htm>. Official bid abstracts will be available and may be requested by sending a self-addressed stamped envelope to: U.S. Army Corps of Engineers, Omaha District, ATTN: CENWO-CT-M(Blume), 106 South 15th Street, Omaha, NE 68102-1618.

27 (FAR 52.233-2) SERVICE OF PROTEST (AUG 1996) .

(a) Protests, as defined in section 33.101 of the Federal Acquisition

Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgement of receipt from District Counsel, 106 South 15th Street, Omaha, Nebraska 68102-1618.

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

28 PRE-AWARD SURVEY INFORMATION (Local Provision) (Sep 93)

In accordance with Paragraph PERFORMANCE AND PAYMENT BONDS, request that the following information be submitted with your bid. This facilitates the award process.

1. Financial

- Name, address, and fax number of Financial Institution
- Name and phone number of finance individual (primary and alternate) to be contacted for information

2. Bonding Information

- Provide the name, address, regular phone number and fax number of your Surety Company.

3. Performance

- Provide three (3) references to be contacted on your company's performance

The following information should be submitted:

- Name and Fax number of Owner/User
- Project Name, Location, Contract Number, and dollar value
- Name and phone number of individuals (primary and alternate) that can verify performance of the project

29 (FAR 52.204-6) DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER (JUNE 1999)

(a) The offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation "DUNS" followed by the DUNS number that identifies the offeror's name and address exactly as stated in the offer. The DUNS number is a nine-digit number assigned by Dun and Bradstreet Information Services.

(b) If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-800-333-0505. The offeror should be prepared to provide the following information:

(1) Company name.

(2) Company address.

- (3) Company telephone number.
- (4) Line of business.
- (5) Chief executive officer/key manager.
- (6) Date the company was started.
- (7) Number of people employed by the company.
- (8) Company affiliation.

(c) Offerors located outside the United States may obtain the location and phone number of the local Dun and Bradstreet Information Services office from the Internet home page at <http://www.customerservice@dnb.com>. If an offeror is unable to locate a local service center, it may send an e-mail to Dun and Bradstreet at globalinfo@mail.dnb.com.

(End of provision)

30 (FAR 52.216-1) TYPE OF CONTRACT (APR 1984) .

The Government contemplates award of a Firm Fixed Price contract resulting from this solicitation.

31 SUBCONTRACTING PLAN/SUBCONTRACTING GOALS REGARDING THE UTILIZATION OF SMALL BUSINESS CONCERNS.

a. Application. This clause applies only to large business concerns submitting bids for services exceeding \$500,000 or for construction exceeding \$1,000,000.

b. Federal Acquisition Regulations (FAR). Attention is directed to the following FAR provisions contained in this solicitation:

52.219-8, Utilization of Small Business Concerns (Alternate I)

52.219-9, Small Business Subcontracting Plan (Alternate I)

52.219-16, Liquidated Damages - Small Business Subcontracting Plan

52.226-1, Utilization of Indian Organizations and Indian-Owned Economic Enterprises

c. Goals. The U.S. Army Corps of Engineers considers the following goals reasonable and achievable for fiscal year 2002 and for the performance of the resultant contract:

(1) 61.4% of planned subcontracting dollars with small business concerns.

(2) 9.1% of planned subcontracting dollars with those small

business concerns owned and controlled by socially and economically disadvantaged individuals.

(3) 5.0% of planned subcontracting dollars with those small business concerns owned and controlled by women.

(4) 3.0% of planned subcontracting dollars with those small business concerns owned and controlled by Severely Disable Veterans.

(5) 2.5% of planned subcontracting dollars with those small business concerns owned and controlled by HubZones.

d. Submission and Review of Subcontracting Plan.

SUBMISSION OF SMALL BUSINESS SUBCONTRACTING PLAN IS NOT APPLICABLE TO SMALL BUSINESSES.

(1) The apparent low bidder must submit a subcontracting plan within five (5) calendar days after bid opening (a longer period maybe granted by the Contracting Officer upon request) within 24 hours after notification by the Government to the Contracting Activity.]

(2) Goals included in the subcontracting plan should be at least equal to those indicated above. If lesser goals are proposed, the bidder may be required to substantiate how the proposed plan represents the bidder's best effort to comply with the terms and conditions of the solicitation. Bidders are highly encouraged to become familiar with the intent of the solicitation provisions and the elements of the subcontracting plan.

(3) The subcontracting plan must contain, as a minimum, the elements set forth in FAR provision 52.219-9. An example subcontracting plan will be furnished to the apparent low bidder (upon request). The example subcontracting plan (if requested) should not be construed as an acceptable subcontracting plan. Any format will be acceptable provided that the plan addresses each element as required by the Federal Acquisition Regulations and its supplements.

(4) Proposed plans will be reviewed by the Government to ensure the plan represents the firm's best efforts to maximize subcontracting opportunities for small, small disadvantaged and women-owned businesses.

(5) Subcontracting plans are required to be approved prior to Contract Award. The approved subcontracting plan (to include goals) will become a material part of the contract.

e. Failing to Submit An Acceptable Subcontracting Plan. An apparent low bidder failing to submit a subcontracting plan which demonstrates a reasonable effort to meet the goals listed above or provide an explanation why lesser goals are proposed (upon request), will be considered as non-responsive and not considered eligible for award of the contract.

f. Questions or Assistance Needed in Developing Subcontracting Plan.

For any questions or assistance needed in developing the subcontracting plan, contact the Contract Specialist or District's Deputing for Small Business (See paragraph: BIDDER QUESTIONS AND COMMENTS, Contract Specialist [Bid Results] or the District's Deputy for Small Business [Small Business] or fax your inquiries to 402-221-4199).

32 (DFARS 252.204-7004) REQUIRED CENTRAL CONTRACTOR REGISTRATION (NOV 2001)

(a) Definitions.

As used in this clause--

(1) "Central Contractor Registration (CCR database" means the primary DoD repository for contractor information required for the conduct of business with DoD.

(2) "Data Universal Numbering System (DUNS) number" means the 9-digit number assigned by Dun and Bradstreet Information Services to identify unique business entities.

(3) "Data Universal Numbering System +4 (DUNS+4) number" means the DUNS number assigned by Dun and Bradstreet plus a 4-digit suffix that may be assigned by a parent (controlling) business concern. This 4-digit suffix may be assigned at the discretion of the parent business concern for such purposes as identifying subunits or affiliates of the parent business concern.

(4) "Registered in the CCR database" means that all mandatory information, including the DUNS number or the DUNS+4 number, if applicable, and the corresponding Commercial and Government Entity (CAGE) code, is in the CCR database; the DUNS number and the CAGE code have been validated; and all edits have been successfully completed.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any contract resulting from this solicitation, except for awards to foreign vendors for work to be performed outside the United States.

(2) The offeror shall provide its DUNS or, if applicable, its DUNS+4 number with its offer, which will be used by the Contracting Officer to verify that the offeror is registered in the CCR database.

(3) Lack of registration in the CCR database will make an offeror ineligible for award.

(4) DoD has established a goal of registering an applicant in the CCR database within 48 hours after receipt of a complete and accurate application via the Internet. However, registration of an applicant submitting an application through a method other than the Internet may take up to 30 days. Therefore, offerors that are not registered should consider applying for registration immediately upon receipt of this solicitation.

(c) The Contractor is responsible for the accuracy and completeness of the data within the CCR, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the CCR database after the initial registration, the Contractor is required to confirm on an annual basis that its information in the CCR database is accurate and complete.

(d) Offerors and contractors may obtain information on registration and annual confirmation requirements by calling 1-888-227-2423, or via the Internet at <http://www.ccr.gov>.

(End of clause)

REQUIRED CENTRAL CONTRACTOR REGISTRATION (CCR)

Register Now: Don't wait until you submit an offer on a solicitation. You must be registered to receive the contract award. It can often take 30 days for CCR to process your registration information.

Register One of Three Ways:

Internet: <http://www.ccr.gov>

Value Added Network (VAN) for EDI users: Contact your VAN for information. If you need to find a VAN look at http://www.acq.osd.mil/ec/ecip/van_list.htm

FAX or Mail: Call (888)227-2423 or (616)961-4725 to receive a registration package. FAX or mail the completed information to the CCR Assistance Center. It can take up to 30 days to process a faxed or mailed package.

CCR Assistance Center
74 Washington Street North, Suite 7
Battle Creek, MI 49017-3084
FAX: (616)961-7243

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF BIDDERS

INDEX

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).
2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).
3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).
4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) [MAY 1999]
5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).
6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (APR 2001).
7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding \$100,000]
8. (DFARS 252.209-7003) COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (MAR 1998)
9. (FAR 52.211-6) BRAND NAME OR EQUAL (AUG 1999).
10. RESERVED
11. RESERVED
12. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2001) ALTERNATE I (OCT 2000) ALTERNATE II (OCT 2000)
13. (FAR 52.219-2) EQUAL LOW BIDS (OCT 1995)
14. RESERVED
15. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).
16. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).
17. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999)
18. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).
19. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997)
20. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts over \$100,000]
21. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)
22. (DFARS 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

SECTION 00600
REPRESENTATIONS, CERTIFICATIONS & OTHER STATEMENTS OF BIDDERS

The bidder (offeror) makes the following certification and representations as a part of the bid, shall check the appropriate boxes, fill in the appropriate information, and provide signatures on the attached "Solicitation Form" (00600) pages, and submit with Standard Form 1442 (Section 00010).

1. (FAR 52.203-2) CERTIFICATE OF INDEPENDENT PRICE DETERMINATION (APR 1985).

(a) The offeror certifies that -

(1) The prices in this offer have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other offeror or competitor relating to (i) those prices, (ii) the intention to submit an offer, or (iii) the methods or factors used to calculate the prices offered;

(2) the prices in this offer have not been and will not be knowingly disclosed by the offeror, directly or indirectly, to any other offeror or competitor before bid opening (in the case of a Sealed Bid solicitation) or contract award (in the case of a negotiated solicitation) unless otherwise required by law; and

(3) no attempt has been made or will be made by the offeror to induce any other concern to submit or not to submit an offer for the purpose of restricting competition.

(b) Each signature on the offer is considered to be a certification by the signatory that the signatory -

(1) is the person in the offeror's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above; or

(2)(i) has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above _____

_____ [insert full name of person(s) in the offeror's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the offeror's organization];

(ii) as an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) as an agent, has not personally participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the offeror deletes or modifies subparagraph (a)(2) above, the offeror must furnish with its offer a signed statement setting forth in detail the circumstances of the disclosure.

2. (FAR 52.203-11) CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (APR 1991).

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies to the best of his or her knowledge and belief that on or after December 23, 1989, -

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB standard form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

3. (FAR 52.204-3) TAXPAYER IDENTIFICATION (OCT 1998).

(a) Definitions.

"Common parent," as used in this provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Taxpayer Identification Number (TIN)," as used in this provision, means the number required by the Internal Revenue Service (IRS) to be used by the offeror in reporting income tax and other returns. The TIN may be either a Social Security Number or an Employer Identification Number.

(b) All offerors must submit the information required in paragraphs (d) through (f) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the IRS. If the resulting contract is subject to the payment reporting requirements described in Federal Acquisition Regulation (FAR) 4.904, the failure or refusal by the offeror to furnish the information may result in a 31 percent reduction of payments otherwise due under the contract.

(c) The TIN may be used by the Government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.

(d) Taxpayer Identification Number (TIN).

[] TIN: _____.

☐ TIN has been applied for.

☐ TIN is not required because:

☐ Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

☐ Offeror is an agency or instrumentality of a foreign government;

☐ Offeror is an agency or instrumentality of the Federal Government.

(e) Type of organization.

☐ Sole proprietorship;

☐ Partnership;

☐ Corporate entity (not tax-exempt);

☐ Corporate entity (tax-exempt);

☐ Government entity (Federal, State, or local);

☐ Foreign government;

☐ International organization per 26 CFR 1.6049-4;

☐ Other _____.

(f) Common parent.

☐ Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this provision.

☐ Name and TIN of common parent:

Name _____

TIN _____

(End of provision)

4. (FAR 52.204-5) WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) [MAY 1999]

(a) *Definition.* Women-owned business concern, as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation.* [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, *Small Business Program Representations*, of this solicitation.] The offeror represents that it ☐ is a women-owned business concern.
(End of provision)

5. (DFARS 252.204-7001) COMMERCIAL AND GOVERNMENT ENTITY (CAGE) CODE REPORTING (AUG 1999).

(a) The offeror is requested to enter its CAGE code on its offer in the block with its name and address. The CAGE code entered must be for that name and address. Enter "CAGE" before the number.

(b) If the offeror does not have a CAGE code, it may ask the Contracting Officer to request one from the Defense Logistics Information Service (DLIS). The Contracting Officer will-

- (1) Ask the Contractor to complete section B of a DD Form 2051, Request for Assignment of a Commercial and Government Entity (CAGE) Code;
- (2) Complete section A and forward the form to DLIS; and
- (3) Notify the Contractor of its assigned CAGE code.

(c) Do not delay submission of the offer pending receipt of a CAGE code.

6. (FAR 52.209-5) CERTIFICATION REGARDING DEBARMENT, SUSPENSION, PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY MATTERS (APR 2001).

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that—

(i) The Offeror and/or any of its Principals—

(A) Are ☐ are not ☐ presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have ☐ have not ☐, within the three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; **[This language stayed indefinitely. Please use paragraph (a)(1)(i)(D) below.]**

(C) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in paragraph (a)(1)(i)(B) of this provision; and **[This language stayed indefinitely. Please use paragraph (a)(1)(i)(E) below.]**

(D) Have ☐ have not ☐, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(E) Are ☐ are not ☐ presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(D) of this provision.

(ii)(A) **[This paragraph (a)(1)(ii) is stayed indefinitely.]** The offeror, aside from the offenses enumerated in paragraphs (a)(1)(i)(A), (B), and (C) of this provision, has ☐ has not ☐ within the past three years, relative to tax, labor and employment, environmental, antitrust, or consumer protection laws—

(1) Been convicted of a Federal or State felony (or has any Federal or State felony indictments currently pending against them); or

(2) Had a Federal court judgment in a civil case brought by the United States rendered against them; or

(3) Had an adverse decision by a Federal administrative law judge, board, or

commission indicating a willful violation of law.

(B) If the offeror has responded affirmatively, the offeror shall provide additional information if requested by the Contracting Officer; and

(iii) The Offeror has [] has not [], within a three-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (*e.g.*, general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

This Certification Concerns a Matter Within the Jurisdiction of an Agency of the United States and the Making of a False, Fictitious, or Fraudulent Certification May Render the Maker Subject to Prosecution Under Section 1001, Title 18, United States Code.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.
(End of Provision)

7. (DFARS 252.209-7001) DISCLOSURE OF OWNERSHIP OR CONTROL BY A FOREIGN GOVERNMENT THAT SUPPORTS TERRORISM (MAR 1998). [For Contracts exceeding \$100,000]

(a) Definitions.

As used in this provision-

(1) "Government of a terrorist country" includes the state and the government of a terrorist country, as well as any political subdivision, agency, or instrumentality thereof.

(2) "Terrorist country" means a country determined by the Secretary of State, under section 6(j)(1)(A)) of the Export Administration Act of 1979 (50 U.S.C. App. 2405(j)(i)(A)), to be a country the government of which has repeatedly provided support for acts of international terrorism. As of the date of this provision, terrorist countries include: Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria.

(3) "Significant interest" means-

(i) Ownership of or beneficial interest in 5 percent or more of the firm's or subsidiary's securities. Beneficial interest includes holding 5 percent or more of any class of the firm's securities in "nominee shares," "street names," or some other method of holding securities that does not disclose the beneficial owner;

(ii) Holding a management position in the firm, such as a director or officer;

(iii) Ability to control or influence the election, appointment, or tenure of directors or officers in the firm;

(iv) Ownership of 10 percent or more of the assets of a firm such as equipment, buildings, real estate, or other tangible assets of the firm; or

(v) Holding 50 percent or more of the indebtedness of a firm.

(b) Prohibition on award. In accordance with 10 U.S.C. 2327, no contract may be awarded to a firm or a subsidiary of a firm if the government of a terrorist country has a significant interest in the firm or subsidiary [or, in the case of a subsidiary, the firm that owns the subsidiary], unless a waiver is granted by the Secretary of Defense.

(c) Disclosure.

The Offeror shall disclose any significant interest the government of each of the following countries has in the Offeror or a subsidiary of the Offeror. If the Offeror is a subsidiary, it shall also disclose any significant interest the government of a terrorist country has in any firm that owns or controls the subsidiary. The disclosure shall include--

(1) Identification of each government holding a significant interest; and

(2) A description of the significant interest held by each Government.

(End of provision)

8. (DFARS 252.209-7003) COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (MAR 1998)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 37 U.S.C. 4212(d) (i.e., the VETS-100 report required by Federal Acquisition Regulation clause 52.222-37, Employment Reports on Disabled Veterans and Veterans of the Vietnam Era), it has submitted the more recent report required by 37 U.S.C. 4212(d).

(End of provision)

9. (FAR 52.211-6) BRAND NAME OR EQUAL (AUG 1999).

(a) If an item in this solicitation is identified as "brand name or equal," the purchase description reflects the characteristics and level of quality that will satisfy the Government's needs. The salient physical, functional, and other characteristics that "equal" products must meet are specified in the solicitation.

(b) To be considered for award, offers of "equal" products, including "equal" products of the brand name manufacturer, must--

(1) Meet the salient physical, functional, and other characteristics specified in the solicitation;

(2) Clearly identify the item by--

(i) Brand name, if any; and

(ii) Make or model number;

(3) Include descriptive literature such as cuts, illustrations, drawings, or a clear reference to previously furnished descriptive data or information available to the Contracting Officer; and

(4) Clearly describe any modifications the offeror plans to make in a product to make it conform to the solicitation requirements. Mark any descriptive material to clearly show the modifications.

(c) The Contracting Officer will evaluate "equal" products on the basis of information by the offeror or identified in the offer and reasonably available to the Contracting Officer. The Contracting Officer is not responsible for locating or securing any information not identified in the offer.

(d) Unless the offeror clearly indicates in its offer that the product being offered is an "equal" product, the offeror shall provide the brand name product referenced in the solicitation.

10. RESERVED

11. RESERVED

12. (FAR 52.219-1) SMALL BUSINESS PROGRAM REPRESENTATIONS (MAY 2001) ALTERNATE I (OCT 2000) ALTERNATE II (OCT 2000)

(a) (1) The North American Industry Classification System (NAICS) code for this acquisition is _____ [insert NAICS code].

(2) The small business size standard is \$_____ (insert size standard).

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b) Representations. (1) The offeror represents as part of its offer that it [] is, [] is not a small business concern.

(2) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, for general statistical purposes, that it [] is, [] is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(3) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it [] is, [] is not a women-owned small business concern.

(4) *[Complete only if the offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents as part of its offer that it [] is, [] is not a veteran-owned small business concern.

(5) *[Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (b)(4) of this provision.]* The offeror represents as part of its offer that it [] is, [] is not a service-disabled veteran-owned small business concern.

(6) *[Complete only if offeror represented itself as a small business concern in paragraph (b)(1) of this provision.]* The offeror represents, as part of its offer, that—

- (i) It [] is, [] is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal place of ownership, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and
- (ii) It [] is, [] is not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (b)(6)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. *[The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.]* Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(7) *[Complete if offeror represented itself as disadvantaged in paragraph (b)(2) of this provision].* The offeror shall check the category in which its ownership falls:

____ Black American.

____ Hispanic American.

____ Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

____ Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

____ Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

____ Individual/concern, other than one of the preceding.

(c) Definitions. As used in this provision—

“Service-disabled veteran-owned small business concern”—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern” means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR part 121 and the size standard in paragraph (a) of this provision.

“Veteran-owned small business concern” means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern” means a small business concern—

(1) That is at least 51 percent owned by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) *Notice.* (1) If this solicitation is for supplies and has been set aside, in whole or in part, for small business concerns, then the clause in this solicitation providing notice of the set-aside contains restrictions on the source of the end items to be furnished.

(2) Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small, small disadvantaged or women-owned small business concern in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall—

(i) Be punished by imposition of fine, imprisonment, or both;

(ii) Be subject to administrative remedies, including suspension and debarment; and

(iii) Be ineligible for participation in programs conducted under the authority of the Act.

13. (FAR 52.219-2) EQUAL LOW BIDS (OCT 1995)

(a) This provision applies to small business concerns only.

(b) The bidder's status as a labor surplus area (LSA) concern may affect entitlement to award in case of tie bids. If the bidder wishes to be considered for this priority, the bidder must identify, in the following space, the LSA in which the costs to be incurred on account of manufacturing or production (by the bidder or the first-tier subcontractors) amount to more than 50 percent of the contract price.

(c) Failure to identify the labor surplus areas as specified in paragraph (b) of this provision will preclude the bidder from receiving priority consideration. If the bidder is awarded a contract as a result of receiving priority consideration under this provision and would not have otherwise received award, the bidder shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

14. RESERVED

15. (FARS 52.219-19) SMALL BUSINESS CONCERN REPRESENTATION FOR THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (OCT 2000).

(a) *Definition.* "Emerging small business" as used in this solicitation, means a small business concern whose size is no greater than 50 percent of the numerical size standard applicable to the North American Industry Classification System (NAICS) code assigned to a contracting opportunity.

(b) (Complete only if Offeror has represented itself under the provision at FAR 52.219-1 as a small business concern under the size standards of this solicitation.) The Offeror [] is, [] is not an emerging small business.

(c) (Complete only if the Offeror is a small business or an emerging small business, indicating its size range.)

Offeror's number of employees for the past 12 months (check this column if size standard stated in solicitation is expressed in terms of number of employees) or Offeror's average annual gross revenue for the last 3 fiscal years (check this column if size standard stated in solicitation is expressed in terms of annual receipts). (Check one of the following.)

No. of Employees	Average Annual Gross Revenues
____ 50 or fewer	____ \$1 million or less
____ 51 - 100	____ \$1,000,001 - \$2 million
____ 101 - 250	____ \$2,000,001 - \$3.5 million
____ 251 - 500	____ \$3,500,001 - \$5 million
____ 501 - 750	____ \$5,000,001 - \$10 million
____ 751 - 1,000	____ \$10,000,001 - \$17 million
____ Over 1,000	____ Over \$17 million

16. (FARS 52.219-21) SMALL BUSINESS SIZE REPRESENTATION FOR TARGETED INDUSTRY CATEGORIES UNDER THE SMALL BUSINESS COMPETITIVENESS DEMONSTRATION PROGRAM (MAY 1999).

[Complete only if the Offeror has represented itself under the provision at 52.219-1 as a small business concern under the size standards of this solicitation.]

Offeror's number of employees for the past 12 months *[check this column if size standard stated in solicitation is expressed in terms of number of employees]* or Offeror's average annual gross revenue for the last 3 fiscal years *[check this column if size standard in solicitation is expressed in terms of annual receipts]*. *[Check one of the following.]*

No. of Employees	Average Annual Gross Revenues
------------------	-------------------------------

_____50 or fewer	_____ \$1 million or less
_____51 - 100	_____ \$1,000,001 - \$2 million
_____101 - 250	_____ \$2,000,001 - \$3.5 million
_____251 - 500	_____ \$3,500,001 - \$5 million
_____501 - 750	_____ \$5,000,001 - \$10 million
_____751 - 1,000	_____ \$10,000,001 - \$17 million
_____Over 1,000	_____Over \$17 million

17. (FAR 52.222-21) CERTIFICATION OF NONSEGREGATED FACILITIES (FEB 1999)

(a) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(b) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

(End of clause)

18. (FAR 52.222-22) PREVIOUS CONTRACTS AND COMPLIANCE REPORTS (FEB 1999).

The offeror represents that—

(a) It [] has, [] has not participated in a previous contract or subcontract subject the Equal Opportunity clause of this solicitation;

(b) It [] has, [] has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of provision)

19. (FAR 52.223-4) RECOVERED MATERIAL CERTIFICATION (OCT 1997)

As required by the Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6962(c)(3)(A)(i)), the offeror certifies, by signing this offer, that the percentage of recovered materials to be used in the performance of the contract will be at least the amount required by the applicable contract specifications.

(End of provision)

**20. (FAR 52.223-13) CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING (OCT 2000)
[For Contracts over \$100,000]**

(a) Submission of this certification is a prerequisite for making or entering into this contract imposed by Executive Order 12969, August 8, 1995.

(b) By signing this offer, the offeror certifies that-

(1) As the owner or operator of a facilities that will be used in the performance of this contract that are subject to the filing and reporting requirements described in section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023) and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106), the offeror will file and continue to file, for such facilities for the life of the contract the Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the EPCRA and section 6607 of PPA; or

(2) None of its owned or operated facilities to be used in the performance of this contract is subject the Form R filing and reporting requirements because each facility is exempt for at least one of the following reasons: (Check each block that is applicable.)

☐ (i) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

☐ (ii) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

☐ (iii) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

☐ (iv) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

☐ (v) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Norther Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

21. (DFARS 252.225-7031) SECONDARY ARAB BOYCOTT OF ISRAEL (JUN 1992)

(a) Definitions. As used in this clause--

(1) "Foreign person" means any person other than a United States person as defined in Section 16(2) of the Export Administration Act of 1979 (50 U.S.C. App. Sec 2415).

(2) "United States person" is defined in Section 16(2) of the Export Administration Act of 1979 and means any United States resident or national (other than an individual resident outside the United States and employed by other than a United States person), any domestic concern (including any permanent domestic establishment of any foreign concern), and any foreign subsidiary or affiliate (including any foreign establishment) of any domestic concern which is controlled in fact by such domestic concern, as determined under regulations of the President.

(b) Certification.

By submitting this offer, the Offeror, if a foreign person, company, company or entity, certifies that it--

(1) Does not comply with the Secondary Arab Boycott of Israel; and

(2) Is not taking or knowingly agreeing to take any action, with respect to the Secondary Boycott of Israel by Arab countries, which 50 U.S.C. App. Sec 2407(a) prohibits a United States person from taking.

(End of clause)

22. (DFARS 252.247-7022) REPRESENTATION OF EXTENT OF TRANSPORTATION BY SEA (AUG 1992).

(a) The Offeror shall indicate by checking the appropriate blank in paragraph (b) of this provision whether transportation of supplies by sea is anticipated under the resultant contract. The term "supplies" is defined in the Transportation of Supplies by Sea clause of this solicitation.

(b) REPRESENTATION. The Offeror represents that it-

_____ Does anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

_____ Does not anticipate that supplies will be transported by sea in the performance of any contract or subcontract resulting from this solicitation.

(c) Any contract resulting from this solicitation will include the Transportation of Supplies by Sea Clause. If the Offeror represents that it will not use ocean transportation, the resulting contract will also include the Defense FAR Supplement clause at 252.247-7024, Notification of Transportation of Supplies by Sea.

SECTION 00700

CONTRACT CLAUSES

INDEX

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)
2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)
3. *FAR 52.202-1 DEFINITIONS (DEC 2001) ALTERNATE I (MAR 2001)
4. *FAR 52.203-3 GRATUITIES (APR 1984)
5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)
6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)
7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)
9. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991) (For Military Contracts Exceeding \$5,000,000)
10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)
11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)
12. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)
13. DFARS 252.204-7003 CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)
14. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)
15. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)
16. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [For Military Contract's Only]
17. FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)
18. *FAR 52.214-26 AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)
19. *FAR 52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA—MODIFICATIONS--SEALED BIDDING (OCT 1997)
20. *FAR 52.214-28 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS—SEALED BIDDING (OCT 1997)
21. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)
22. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)
23. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001) [When Contracting By Negotiations]
24. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001) --ALTERNATE I (OCT 2001) [When Contracting By Sealed Bidding]
25. DFARS 252.219-7009 SECTION 8(a) DIRECT AWARD (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]
26. *FAR 52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996) [For Small Business Set Aside Only]
27. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

28. DFARS 252.219-7010 ALTERNATE A (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]
29. FAR 52.219-18 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS (JUNE 1999) [When Competitive 8(a) Contracting Procedures are used]
30. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)
31. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)
32. *FAR 52.222-3 CONVICT LABOR (AUG 1996)
33. *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—OVERTIME COMPENSATION (SEPT 2000)
34. *FAR 52.222-6 DAVIS-BACON ACT (FEB 1995)
35. *FAR 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)
36. *FAR 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)
37. *FAR 52.222-9 APPRENTICES AND TRAINEES (FEB 1988)
38. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)
39. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)
40. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)
41. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)
42. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)
43. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)
44. *FAR 52.222-26 EQUAL OPPORTUNITY (FEB 1999)
45. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)
46. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)
47. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)
48. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)
49. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)
50. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [For Work on Federal Facilities]
51. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)
52. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding \$100,000. EPA Designated product (available at <http://www.epa.gov/cpg/>)]
53. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts Over \$100,000]
54. RESERVED
55. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)
56. *FAR 52.225-9 BUY AMERICAN ACT—BALANCE OF PAYMENT PROGRAM—CONSTRUCTION MATERIALS (FEB 2000) (For Contracts less than \$6.806 million)
57. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS (FEB 2000) (Applicable with FAR 52.225-9)
58. *FAR 52.225-11 BUY AMERICAN ACT—BALANCE OF PAYMENTS PROGRAM-CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000) [For Contracts more than \$6,806,000] ALTERNATE I (JUNE 2000) [For Contracts between \$6.806 and 7.068419 Million]
59. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000) [Applicable with FAR 52.225-11]] Alternate II (June 2000) [For Contracts Between 6.806 and 7.068419 Million]
60. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

61. *FAR 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (JUNE 2000)
62. *FAR 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)
63. *FAR 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)
64. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)
65. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)
66. FAR 52.228-1 BID GUARANTEE (SEP 1996) [NOTE: Not required for projects less than \$100,000]
67. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)
68. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding \$100,000]
69. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)
70. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)
71. FAR 52.228-13 ALTERNATIVE PAYMENT PROTECTIONS (JULY 2000) [Applicable only for projects or delivery orders less than \$100,000]
72. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)
73. FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000).
74. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991) [For Contracts Exceeding \$100,000]
75. *FAR 52.229-5 TAXES--CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO (APR 1984)
76. DFARS 252.231-7000 SUPPLEMENTAL COST PRINCIPLES (DEC 1991)
77. *FAR 52.232-5 PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY 1997)
78. RESERVED.
79. *FAR 52.232-17 INTEREST (JUN 1996)
80. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)
81. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (MAY 2001)
82. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER --CENTRAL CONTRACTOR REGISTRATION (MAY 1999)
83. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)
84. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)
85. *FAR 52.233-1 DISPUTES (DEC 1998)
86. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)
87. RESERVED
88. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)
89. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)
90. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)
91. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER --CENTRAL CONTRACTOR REGISTRATION (MAY 1999)
92. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)
93. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)
94. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)
95. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)
96. *FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)
97. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)
98. *FAR 52.236-12 CLEANING UP (APR 1984)
99. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)
100. *FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)
101. FAR 52.236-15 SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)
102. *FAR 52.236-17 LAYOUT OF WORK (APR 1984)
103. FAR 52.236-21 SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)
104. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)
105. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

- 106. DFARS 252.236-7008 CONTRACT PRICES - BIDDING SCHEDULES (DEC 1991)
- 107. *FAR 52.242-13 BANKRUPTCY (JUL 1995)
- 108. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)
- 109. FAR 52.243-4 CHANGES (AUG 1987)
- 110. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)
- 111. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)
- 112. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)
- 113. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2001)
- 114. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over \$100,000]
- 115. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984) [For Government Property \$100,000 or Less]
- 116. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)
- 117. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)
- 118. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
- 119. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)
- 120. FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALTERNATE I (APR 1984)
- 121. *FAR 52.249-1 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) (APR 1984) [For Contracts \$100,000 or Less]
- 122. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over \$100,000]
- 123. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)
- 124. ENVIRONMENTAL LITIGATION (1974 NOV OCE)
- 125. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS
- 126. INAPPLICABLE PROVISIONS AND CLAUSES (Local Provision). [Applicable only for projects or delivery orders less than \$100,000]

SECTION 00700

CONTRACT CLAUSES

1. FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

<http://www.arnet.gov/far>

(End of clause)

* - CONTRACT CLAUSES THAT MAY BE INCORPORATED BY REFERENCE

2. DFARS 252.201-7000 CONTRACTING OFFICER'S REPRESENTATIVE (DEC 1991)

(a) Definition.

"Contracting officer's representative" means an individual designated in accordance with subsection 201.602-2 of the Defense Federal Acquisition Regulation Supplement and authorized in writing by the contracting officer to perform specific technical or administrative functions.

(b) If the Contracting Officer designates a contracting officer's representative (COR), the Contractor will receive a copy of the written designation. It will specify the extent of the COR's authority to act on behalf of the contracting officer. The COR is not authorized to make any commitments or changes that will affect price, quality, quantity, delivery, or any other term or condition of the contract.

(End of clause)

3. *FAR 52.202-1 DEFINITIONS (DEC 2001) ALTERNATE I (MAR 2001)

a) "Agency head" or "head of the agency" means the Secretary (Attorney General, Administrator, Governor, Chairperson, or other chief official, as appropriate) of the agency, unless otherwise indicated, including any deputy or assistant chief official of the executive agency.

(b) "Commercial component" means any component that is a commercial item.

(c) "Commercial item" means—

(1) Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and that—

(i) Has been sold, leased, or licensed to the general public; or

(ii) Has been offered for sale, lease, or license to the general public;

(2) Any item that evolved from an item described in paragraph (c)(1) of this clause through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

(3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (c)(2) of this clause, but for—

(i) Modifications of a type customarily available in the commercial marketplace; or

(ii) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. "Minor" modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or

change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

(4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this clause that are of a type customarily combined and sold in combination to the general public;

(5) Installation services, maintenance services, repair services, training services, and other services if—

(i) Such services are procured for support of an item referred to in paragraph (c)(1), (2), (3), or (4) of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and

(ii) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government

(6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed. For purposes of these services—

(i) “Catalog price” means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(ii) “Market prices” means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

(7) Any item, combination of items, or service referred to in paragraphs (c)(1) through (c)(6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or

(8) A nondevelopmental item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments.

(d) “Component” means any item supplied to the Government as part of an end item or of another component, except that for use in 52.225-9, and 52.225-11 see the definitions in 52.225-9(a) and 52.225-11(a).

(e) “Contracting Officer” means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.

(f) “Nondevelopmental item” means—

(1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

(2) Any item described in paragraph (f)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

(3) Any item of supply being produced that does not meet the requirements of paragraph (f)(1) or (f)(2) solely because the item is not yet in use.

(End of clause)

4. *FAR 52.203-3 GRATUITIES (APR 1984)

(a) The right of the Contractor to proceed may be terminated by written notice if, after notice and hearing, the agency head or a designee determines that the Contractor, its agent, or another representative--

(1) Offered or gave a gratuity (e.g., an entertainment or gift) to an officer, official, or employee of the Government; and

(2) Intended, by the gratuity, to obtain a contract or favorable treatment under a contract.

- (b) The facts supporting this determination may be reviewed by any court having lawful jurisdiction.
- (c) If this contract is terminated under paragraph (a) above, the Government is entitled--
 - (1) To pursue the same remedies as in a breach of the contract; and
 - (2) In addition to any other damages provided by law, to exemplary damages of not less than 3 nor more than 10 times the cost incurred by the Contractor in giving gratuities to the person concerned, as determined by the agency head or a designee. (This subparagraph (c)(2) is applicable only if this contract uses money appropriated to the Department of Defense.)
- (d) The rights and remedies of the Government provided in this clause shall not be exclusive and are in addition to any other rights and remedies provided by law or under this contract.

5. *FAR 52.203-5 COVENANT AGAINST CONTINGENT FEES (APR 1984)

(a) The Contractor warrants that no person or agency has been employed or retained to solicit or obtain this contract upon an agreement or understanding for a contingent fee, except a bona fide employee or agency. For breach or violation of this warranty, the Government shall have the right to annul this contract without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of the contingent fee.

(b) "Bona fide agency," as used in this clause, means an established commercial or selling agency, maintained by a contractor for the purpose of securing business, that neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds itself out as being able to obtain any Government contract or contracts through improper influence.

"Bona fide employee," as used in this clause, means a person, employed by a contractor and subject to the contractor's supervision and control as to time, place, and manner of performance, who neither exerts nor proposes to exert improper influence to solicit or obtain Government contracts nor holds out as being able to obtain any Government contract or contracts through improper influence.

"Contingent fee," as used in this clause, means any commission, percentage, brokerage, or other fee that is contingent upon the success that a person or concern has in securing a Government contract.

"Improper influence," as used in this clause, means any influence that induces or tends to induce a Government employee or officer to give consideration or to act regarding a Government contract on any basis other than the merits of the matter.

6. *FAR 52.203-7 ANTI-KICKBACK PROCEDURES (JUL 1995)

(a) Definitions.

"Kickback," as used in this clause, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract. "Person," as used in this clause, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.

"Prime contract," as used in this clause, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.

"Prime Contractor," as used in this clause, means a person who has entered into a prime contract with the United States.

"Prime Contractor employee," as used in this clause, means any officer, partner, employee, or agent of a prime Contractor.

"Subcontract," as used in this clause, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.

"Subcontractor," as used in this clause, (1) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a

subcontract entered into in connection with such prime contract, and (2) includes any person who offers to furnish or furnishes general supplies to the prime Contractor or a higher tier subcontractor.

"Subcontractor employee," as used in this clause, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from--

(1) Providing or attempting to provide or offering to provide any kickback;

(2) Soliciting, accepting, or attempting to accept any kickback; or

(3) Including, directly or indirectly, the amount of any kickback in the contract price charged by a prime Contractor to the United States or in the contract price charged by a subcontractor to a prime Contractor or higher tier subcontractor.

(c) (1) The Contractor shall have in place and follow reasonable procedures designed to prevent and detect possible violations described in paragraph (b) of this clause in its own operations and direct business relationships.

(2) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this clause may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(3) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this clause.

(4) The Contracting Officer may

(i) offset the amount of the kickback against any monies owed by the United States under the prime contract and/or

(ii) direct that the Prime Contractor withhold from sums owed a subcontractor under the prime contract the amount of the kickback. The Contracting Officer may order that monies withheld under subdivision (c)(4)(ii) of this clause be paid over to the Government unless the Government has already offset those monies under subdivision (c)(4)(i) of this clause. In either case, the Prime Contractor shall notify the Contracting Officer when the monies are withheld.

(5) The Contractor agrees to incorporate the substance of this clause, including subparagraph (c)(5) but excepting subparagraph (c)(1), in all subcontracts under this contract which exceed \$100,000.

7. *FAR 52.203-8 CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) If the Government receives information that a contractor or a person has engaged in conduct constituting a violation of subsection (a), (b), (c), or (d) of Section 27 of the Office of Federal Procurement Policy Act (41 U.S.C. 423) (the Act), as amended by section 4304 of the National Defense Authorization Act for Fiscal Year 1996 (Pub. L. 104-106), the Government may--

(1) Cancel the solicitation, if the contract has not yet been awarded or issued; or

(2) Rescind the contract with respect to which--

(i) The Contractor or someone acting for the Contractor has been convicted for an offense where the conduct constitutes a violation of subsection 27 (a) or (b) of the Act for the purpose of either--

(A) Exchanging the information covered by such subsections for anything of value; or

(B) Obtaining or giving anyone a competitive advantage in the award of a Federal agency procurement contract; or

(ii) The head of the contracting activity has determined, based upon a preponderance of the evidence, that the Contractor or someone acting for the Contractor has engaged in conduct constituting an offense punishable under subsection 27(e)(1) of the Act.

(b) If the Government rescinds the contract under paragraph (a) of this clause, the Government is entitled to recover, in addition to any penalty prescribed by law, the amount expended under the contract.

(c) The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law, regulation, or under this contract.

8. DFARS 252.203-7001 PROHIBITION ON PERSONS CONVICTED OF FRAUD OR OTHER DEFENSE—CONTRACT-RELATED FELONIES (MARCH 1999)

- (a) Definitions.
As used in this clause--
 - (1) "Arising out of a contract with the "DoD" means any any act in connection with--
 - (i) Attempting to obtain;
 - (ii) Obtaining; or
 - (iii) Performing a contract or first-tier subcontract of any department, or component of the Department of Defense (DoD).
 - (2) "Conviction of fraud or any other felony," means any conviction for fraud or a felony in violation of state or Federal criminal statutes, whether entered on a verdict or plea, including a plea of nolo contendere, for which sentence has been imposed.
 - (3) "Date of conviction," means the date judgement was entered against the individual.
- (b) Any individual who is convicted after September 29, 1988 of fraud or any other felony arising out of a contract with the DoD is prohibited from serving--
 - (1) In a management or supervisory capacity on any DoD contract or first-tier subcontract;
 - (2) On board of directors of any DoD Contractor or first-tier subcontractor;
 - (3) As a consultant to any DoD Contractor or first-tier subcontractor; or
 - (4) In any other capacity with the authority to influence, advise, or control the decisions of any DoD contractor or subcontractor with regard to any DoD contract or first-tier subcontract.
- (c) Unless waived, the prohibition in paragraph (b) of this clause applies for not less than five years from the date of conviction.
- (d) 10 U.S.C. 2408 provides that a defense Contractor or first-tier subcontractor shall be subject to a criminal penalty of not more than \$500,000 if convicted of knowingly--
 - (1) Employing a person under a prohibition in paragraph (b) of this clause;
 - (2) Allowing such a person to serve on the board of directors of Contractor or first-tier subcontractor.
- (e) In addition to the criminal penalties contained in 10 U.S.C. 2408, the Government may consider other available remedies, such as--
 - (1) Suspension or debarment;
 - (2) Cancellation of the contract at no cost to the Government; or
 - (3) Termination of the contract for default.
- (f) The Contractor may submit written requests for waiver of the prohibition in paragraph (b) of this clause to the Contracting Officer. Requests shall clearly identify--
 - (1) The person involved;
 - (2) The nature of the conviction and resultant sentence or punishment imposed;
 - (3) The reasons for the requested waiver; and
 - (4) An explanation of why a waiver is in the interest of national security.
- (g) The Contractor agrees to include the substance of this clause appropriately modified to reflect the identity and relationship of the parties, in all first-tier subcontracts exceeding the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation, except those for commercial items or components.
- (h) Pursuant to 10 U.S.C.2408(c), defense contractors and subcontractors may obtain information as to whether a particular has been convicted of fraud or any other felony arising out of a contract with the DoD by contracting The Office of Justice Programs, The Denial of Federal Benefits Office, U.S. Department of Justice, telephone (202) 616-3507.

9. DFARS 252.203-7002 DISPLAY OF DOD HOTLINE POSTER (DEC 1991) (For Military Contracts Exceeding \$5,000,000)

- (a) The Contractor shall display prominently in common work areas within business segments performing work under Department of Defense (DoD) contracts, DoD Hotline Posters prepared by DoD Office of the Inspector General.

(b) DoD Hotline Posters may be obtained from the DoD Inspector General, ATTN: Defense Hotline, 400 Army Navy Drive, Washington DC 22202-2884.

(c) The Contract need not comply with paragraph (a) of this clause if it has established a mechanism, such as a hotline, by which employees may report suspected instances of improper conduct, and instructions that encourage employees to make such reports.

10. *FAR 52.203-10 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (JAN 1997)

(a) The Government, at its election, may reduce the price of a fixed-price type contract and the total cost and fee under a cost-type contract of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or designee determines that there was a violation of subsection 27(a), (b), or (c) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in section 3.104 of the Federal Acquisition Regulation.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be--

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract;

(3) For cost-plus-award-fee contracts--

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may--

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts, by 10 percent of the initial contract price or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

11. *FAR 52.203-12 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (JUN 1997)

(a) Definitions.

"Agency," as used in this clause, means executive agency as defined in 2.101.

"Covered Federal Action," as used in this clause, means any of the following Federal actions:

(1) The awarding of any Federal contract.

(2) The making of any Federal grant.

(3) The making of any Federal loan.

(4) The entering into of any cooperative agreement.

(5) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

(1) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.

(2) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.

(3) A special Government employee, as defined in section 202, title 18, United States Code.

(4) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal Contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: The awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent amendments.

(E) Only those services expressly authorized by subdivision (b)(3)(i)(A) of this clause are permitted under this clause.

(ii) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person, other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(ii)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable. Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or

negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(1) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(C) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or receives any subcontract exceeding \$100,000 under the Federal contract.

(D) All subcontractor disclosure forms (but not certifications) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(iv) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(B) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(vi) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

12. *FAR 52.204-4 PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (AUG 2000)

(a) Definitions. As used in this clause—

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.” For paper and paper products, postconsumer material means “postconsumer fiber” defined by the U.S. Environmental Protection Agency (EPA) as—

(1) Paper, paperboard, and fibrous materials from retail stores, office buildings, homes, and so forth, after they have passed through their end-usage as a consumer item, including: used corrugated boxes; old newspapers; old magazines; mixed waste paper; tabulating cards; and used cordage; or

(2) All paper, paperboard, and fibrous materials that enter and are collected from municipal solid waste; but not

(3) Fiber derived from printers' over-runs, converters' scrap, and over-issue publications.

“Printed or copied double-sided” means printing or reproducing a document so that information is on both sides of a sheet of paper.

“Recovered material,” for paper and paper products, is defined by EPA in its Comprehensive Procurement Guideline as “recovered fiber” and means the following materials:

(1) Postconsumer fiber; and

(2) Manufacturing wastes such as—

(i) Dry paper and paperboard waste generated after completion of the papermaking process (that is, those manufacturing operations up to and including the cutting and trimming of the paper machine reel into smaller rolls or rough sheets) including: envelope cuttings, bindery trimmings, and other paper and paperboard waste resulting from printing, cutting, forming, and other converting operations; bag, box, and carton manufacturing wastes; and butt rolls, mill wrappers, and rejected unused stock; and

(ii) Repulped finished paper and paperboard from obsolete inventories of paper and paperboard manufacturers, merchants, wholesalers, dealers, printers, converters, or others.

(b) In accordance with Section 101 of Executive Order 13101 of September 14, 1998, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition, the Contractor is encouraged to submit paper documents, such as offers, letters, or reports, that are printed or copied double-sided on recycled paper that meet minimum content standards specified in Section 505 of Executive Order 13101, when not using electronic commerce methods to submit information or data to the Government.

(c) If the Contractor cannot purchase high-speed copier paper, offset paper, forms bond, computer printout paper, carbonless paper, file folders, white wove envelopes, writing and office paper, book paper, cotton fiber paper, and cover stock meeting the 30 percent postconsumer material standard for use in submitting paper documents to the Government, it should use paper containing no less than 20 percent postconsumer material. This lesser standard should be used only when paper meeting the 30 percent postconsumer material standard is not obtainable at a reasonable price or does not meet reasonable performance standards.

(End of clause)

13. DFARS 252.204-7003

CONTROL OF GOVERNMENT PERSONNEL WORK PRODUCT (APR 1992)

The Contractor's procedures for protecting against unauthorized disclosure of information shall not require Department of Defense employees or members of the Armed Forces to relinquish control of their work products, whether classified or not, to the Contractor.

14. *FAR 52.209-6 PROTECTING THE GOVERNMENTS INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT (JUL 1995)

(a) The Government suspends or debar Contractors to protect the Government's interests. The Contractor shall not enter into any subcontract in excess of \$25,000 with a Contractor that is debarred, suspended, or proposed for debarment unless there is a compelling reason to do so.

(b) The Contractor shall require each proposed first-tier subcontractor, whose subcontract will exceed \$25,000, to disclose to the Contractor, in writing, whether as of the time of award of the subcontract, the subcontractor, or its principals, is or is not debarred, suspended, or proposed for debarment by the Federal Government.

(c) A corporate office or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is debarred, suspended, or proposed for debarment (see FAR 9.404 for information on the List of Parties Excluded from Procurement Programs). The notice must include the following:

- (1) The name of the subcontractor.
- (2) The Contractor's knowledge of the reasons for the subcontractor being on the List of Parties Excluded from Procurement Programs.
- (3) The compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Procurement Programs.
- (4) The systems and procedures the Contractor has established to ensure that it is fully protecting the Government's interests when dealing with such subcontractor in view of the specific basis for the party's debarment, suspension, or proposed debarment.

15. DFARS 252.209-7004 SUBCONTRACTING WITH FIRMS THAT ARE OWNED OR CONTROLLED BY THE GOVERNMENT OF A TERRORIST COUNTRY (MAR 1998)

(a) Unless the Government determines that there is a compelling reason to do so, the Contractor shall not enter into any subcontract in excess of \$25,000 with a firm, or a subsidiary of a firm, that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country.

(b) A corporate officer or a designee of the Contractor shall notify the Contracting Officer, in writing, before entering into a subcontract with a party that is identified, on the List of Parties Excluded from Federal Procurement and Nonprocurement Programs, as being ineligible for the award of Defense contracts or subcontracts because it is owned or controlled by the government of a terrorist country. The notice must include the name of the proposed subcontractor and the compelling reason(s) for doing business with the subcontractor notwithstanding its inclusion on the List of Parties Excluded From Federal Procurement and Nonprocurement Programs.

(End of clause)

16. *FAR 52.211-15 DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS (SEP 1990) [For Military Contract's Only]

This is a rated order certified for national defense use, and the Contractor shall follow all the requirements of the Defense Priorities and Allocations System regulation (15 CFR 700).

17. FAR 52.211-18 VARIATION IN ESTIMATED QUANTITY (APR 1984)

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than 15 percent above or below the estimated quantity, an equitable adjustment in the contract price shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Contracting Officer within 10 days from the beginning of the delay, or within such further period as may be granted by the Contracting Officer before the date of final settlement of the contract. Upon the receipt of a written request for an extension, the Contracting

Officer shall ascertain the facts and make an adjustment for extending the completion date as, in the judgement of the Contracting Officer, is justified.

18. *FAR 52.214-26 AUDIT AND RECORDS--SEALED BIDDING (OCT 1997)

(a) As used in this clause, "records" includes books, documents, accounting procedures and practices, and other data, regardless of whether such items are in written form, in the form of computer data, or in any other form.

(b) Cost or pricing data. If the Contractor has submitted cost or pricing data in connection with the pricing of any modification to this contract, the Contracting Officer or authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections related to--

- (1) The proposal for the modification;
- (2) The discussions conducted on the proposal(s), including those related to negotiating;
- (3) Pricing of the modification; or
- (4) Performance of the modification.

(c) Comptroller General. In the case of pricing any modification, the Comptroller General of the United States, or an authorized representative, shall have the same rights as specified in paragraph (b) of this clause.

(d) Availability. The Contractor shall make available at its office at all reasonable times the materials described in paragraph (b) of this clause, for examination, audit, or reproduction, until 3 years after final payment under this contract, or for any other period specified in Subpart 4.7 of the Federal Acquisition Regulation (FAR). FAR Subpart 4.7, Contractor Records Retention, in effect on the date of this contract, is incorporated by reference in its entirety and made a part of this contract.

(1) If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement.

(2) Records pertaining to appeals under the Disputes clause or to litigation or the settlement of claims arising under or relating to the performance of this contract shall be made available until disposition of such appeals, litigation, or claims.

(e) The Contractor shall insert a clause containing all the provisions of this clause, including this paragraph (e), in all subcontracts expected to exceed the threshold in FAR 15.403-4(a)(1) for submission of cost or pricing data.

**19. *FAR 52.214-27 PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA—
MODIFICATIONS--SEALED BIDDING (OCT 1997)**

(a) This clause shall become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), except that this clause does not apply to any modification if an exception under FAR 15.403-1(b) applies.

(b) If any price, including profit, negotiated in connection with any modification under this clause, was increased by any significant amount because

(1) The Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data,

(2) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or

(3) Any of these parties furnished data of any description that were not accurate, the price shall be reduced accordingly and the contract shall be modified to reflect the reduction. This right to a price reduction is limited to that resulting from defects in data relating to modifications for which this clause becomes operative under paragraph (a) of this clause.

- (c) Any reduction in the contract price under paragraph (b) above due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which
- (1) the actual subcontract or
 - (2) the actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.
- (d) (1) If the Contracting Officer determines under paragraph (b) of this clause that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:
- (i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.
 - (ii) The Contracting Officer should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of the Contracting Officer.
 - (iii) The contract was based on an agreement about the total cost of the contract and there was no agreement about the cost of each item procured under the contract.
 - (iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.
- (2) (i) Except as prohibited by subdivision (d)(2)(ii) of this clause, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a contract price reduction if--
- (A) The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and
 - (B) The Contractor proves that the cost or pricing data were available before the date of agreement on the price of the contract (or price of the modification) and that the data were not submitted before such date.
- (ii) An offset shall not be allowed if--
- (A) The understated data was known by the Contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or
 - (B) The Government proves that the facts demonstrate that the contract price would not have increased in the amount to be offset even if the available data had been submitted before the date of agreement on price.
- (e) If any reduction in the contract price under this clause reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall pay the United States at the time such overpayment is repaid--
- (1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Contractor at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and
 - (2) A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data which were incomplete, inaccurate, or noncurrent.

20. *FAR 52.214-28 SUBCONTRACTOR COST OR PRICING DATA--MODIFICATIONS--SEALED BIDDING (OCT 1997)

- (a) The requirements of paragraphs (b) and (c) of this clause shall--
- (1) Become operative only for any modification to this contract involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1); and

(2) Be limited to such modifications.

(b) Before awarding any subcontract expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), on the date of agreement on price or the date of award, whichever is later; or before pricing any subcontract modification involving aggregate increases and/or decreases in costs, plus applicable profits, expected to exceed the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1), the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless an exception under FAR 15.403-1(b) applies.

(c) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR subsection 15.406-2 that, to the best of its knowledge and belief, the data submitted under paragraph (b) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.

(d) The Contractor shall insert the substance of this clause, including this paragraph (d), in each subcontract that when entered into, exceeds the threshold for submission of cost or pricing data at FAR 15.403-4(a)(1).

(End of clause)

21. *FAR 52.219-4 NOTICE OF PRICE EVALUATION PREFERENCE FOR HUBZONE SMALL BUSINESS CONCERNS (JAN 1999)

(a) *Definition.* "HUBZone small business concern," as used in this clause, means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration.

(b) *Evaluation preference.* (1) Offers will be evaluated by adding a factor of 10 percent to the price of all offers, except—

(i) Offers from HUBZone small business concerns that have not waived the evaluation preference;

(ii) Otherwise successful offers from small business concerns;

(iii) Otherwise successful offers of eligible products under the Trade Agreements Act when the dollar threshold for application of the Act is exceeded (see 25.402 of the Federal Acquisition Regulation (FAR)); and

(iv) Otherwise successful offers where application of the factor would be inconsistent with a Memorandum of Understanding or other international agreement with a foreign government.

(2) The factor of 10 percent shall be applied on a line item basis or to any group of items on which award may be made. Other evaluation factors described in the solicitation shall be applied before application of the factor.

(3) A concern that is both a HUBZone small business concern and a small disadvantaged business concern will receive the benefit of both the HUBZone small business price evaluation preference and the small disadvantaged business price evaluation adjustment (see FAR clause 52.219-23). Each applicable price evaluation preference or adjustment shall be calculated independently against an offeror's base offer. These individual preference amounts shall be added together to arrive at the total evaluated price for that offer.

(c) *Waiver of evaluation preference.* A HUBZone small business concern may elect to waive the evaluation preference, in which case the factor will be added to its offer for evaluation purposes. The agreements in paragraph (d) of this clause do not apply if the offeror has waived the evaluation preference.

[] Offeror elects to waive the evaluation preference.

(d) *Agreement.* A HUBZone small business concern agrees that in the performance of the contract, in the case of a contract for—

(1) Services (except construction), at least 50 percent of the cost of personnel for contract performance will be spent for employees of the concern or employees of other HUBZone small business concerns;

(2) Supplies (other than procurement from a nonmanufacturer of such supplies), at least 50 percent of the cost of manufacturing, excluding the cost of materials, will be performed by the concern or other HUBZone

small business concerns;

(3) General construction, at least 15 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns; or

(4) Construction by special trade contractors, at least 25 percent of the cost of the contract performance incurred for personnel will be spent on the concern's employees or the employees of other HUBZone small business concerns.

(e) A HUBZone joint venture agrees that in the performance of the contract, the applicable percentage specified in paragraph (d) of this clause will be performed by the HUBZone small business participant or participants.

(f) A HUBZone small business concern nonmanufacturer agrees to furnish in performing this contract only end items manufactured or produced by HUBZone small business manufacturer concerns. This paragraph does not apply in connection with construction or service contracts.

(End of clause)

22. *FAR 52.219-8 UTILIZATION OF SMALL BUSINESS CONCERNS (OCT 2000)

(a) It is the policy of the United States that small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns shall have the maximum practicable opportunity to participate in performing contracts let by any Federal agency, including contracts and subcontracts for subsystems, assemblies, components, and related services for major systems. It is further the policy of the United States that its prime contractors establish procedures to ensure the timely payment of amounts due pursuant to the terms of their subcontracts with small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, and women-owned small business concerns.

(b) The Contractor hereby agrees to carry out this policy in the awarding of subcontracts to the fullest extent consistent with efficient contract performance. The Contractor further agrees to cooperate in any studies or surveys as may be conducted by the United States Small Business Administration or the awarding agency of the United States as may be necessary to determine the extent of the Contractor's compliance with this clause.

(c) *Definitions.* As used in this contract—

“HUBZone small business concern” means a small business concern that appears on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration .

“Service-disabled veteran-owned small business concern ” —

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

“Small business concern” means a small business as defined pursuant to Section 3 of the Small Business Act and relevant regulations promulgated pursuant thereto.

“Small disadvantaged business concern” means a small business concern that represents, as part of its offer that—

(1) It has received certification as a small disadvantaged business concern consistent with 13 CFR part 124, Subpart B;

(2) No material change in disadvantaged ownership and control has occurred since its certification;

(3) Where the concern is owned by one or more individuals, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); and

(4) It is identified, on the date of its representation, as a certified small disadvantaged business in the database maintained by the Small Business Administration (PRO-Net).

“Veteran-owned small business concern” means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

“Women-owned small business concern” means a small business concern—

(1) That is at least 51 percent owned by one or more women, or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(d) Contractors acting in good faith may rely on written representations by their subcontractors regarding their status as a small business concern, a veteran-owned small business concern, a service-disabled veteran-owned small business concern, a HUBZone small business concern, a small disadvantaged business concern, or a women-owned small business concern.

(End of clause)

23. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001) [When Contracting By Negotiations]

(a) This clause does not apply to small business concerns.

(b) *Definitions.* As used in this clause—

“Commercial item” means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

“Commercial plan” means a subcontracting plan (including goals) that covers the offeror’s fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

“Individual contract plan” means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror’s planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

“Master plan” means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

“Subcontract” means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The offeror, upon request by the Contracting Officer, shall submit and negotiate a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business concerns, small disadvantaged business, and women-owned small business concerns. If the offeror is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be negotiated within the time specified by the Contracting Officer. Failure to submit and negotiate the subcontracting plan shall make the offeror ineligible for award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. Service-disabled veteran-owned small business concerns meet the definition of veteran-

owned small business concerns, and offerors may include them within the subcontracting plan goal for veteran-owned small business concerns. A separate goal for service-disabled veteran-owned small business concerns is not required. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror's total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRO-Net as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the

requirements of this clause.

(10) Assurances that the offeror will—

(i) Cooperate in any studies or surveys as may be required;

(ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;

(iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

(iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

(i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

(ii) Organizations contacted in an attempt to locate sources that are small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than \$100,000, indicating—

(A) Whether small business concerns were solicited and, if not, why not;

(B) Whether veteran-owned small business concerns were solicited and, if not, why not;

(C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;

(D) Whether HUBZone small business concerns were solicited and, if not, why not;

(E) Whether small disadvantaged business concerns were solicited and, if not, why not;

(F) Whether women-owned small business concerns were solicited and, if not, why not; and

(G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

(A) Trade associations;

(B) Business development organizations;

(C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and

(D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

(A) Workshops, seminars, training, etc.; and

(B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

(1) The master plan has been approved;

(2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts*. This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report*. This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

24. *FAR 52.219-9 SMALL BUSINESS SUBCONTRACTING PLAN (OCT 2001) --ALTERNATE I (OCT 2001) [When Contracting By Sealed Bidding]

(a) This clause does not apply to small business concerns.

(b) *Definitions*. As used in this clause—

“Commercial item” means a product or service that satisfies the definition of commercial item in section 2.101 of the Federal Acquisition Regulation.

“Commercial plan” means a subcontracting plan (including goals) that covers the offeror’s fiscal year and that applies to the entire production of commercial items sold by either the entire company or a portion thereof (*e.g.*, division, plant, or product line).

“Individual contract plan” means a subcontracting plan that covers the entire contract period (including option periods), applies to a specific contract, and has goals that are based on the offeror’s planned subcontracting in support of the specific contract, except that indirect costs incurred for common or joint purposes may be allocated on a prorated basis to the contract.

“Master plan” means a subcontracting plan that contains all the required elements of an individual contract plan, except goals, and may be incorporated into individual contract plans, provided the master plan has been approved.

“Subcontract” means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(c) The apparent low bidder, upon request by the Contracting Officer, shall submit a subcontracting plan, where applicable, that separately addresses subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns. If the bidder is submitting an individual contract plan, the plan must separately address subcontracting with small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns, with a separate part for the basic contract and separate parts for each option (if any). The plan shall be included in and made a part of the resultant contract. The subcontracting plan shall be submitted within the time specified by the Contracting Officer. Failure to submit the subcontracting plan shall make the bidder ineligible for the award of a contract.

(d) The offeror's subcontracting plan shall include the following:

(1) Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns as subcontractors. Service-disabled veteran-owned small business concerns meet the definition of veteran-owned small business concerns, and offerors may include them within the subcontracting plan goal for veteran-owned small business concerns. A separate goal for service-disabled veteran-owned small business concerns is not required. The offeror shall include all subcontracts that contribute to contract performance, and may include a proportionate share of products and services that are normally allocated as indirect costs.

(2) A statement of—

(i) Total dollars planned to be subcontracted for an individual contract plan; or the offeror’s total projected sales, expressed in dollars, and the total value of projected subcontracts to support the sales for a commercial plan;

(ii) Total dollars planned to be subcontracted to small business concerns;

(iii) Total dollars planned to be subcontracted to veteran-owned small business concerns;

(iv) Total dollars planned to be subcontracted to service-disabled veteran-owned small business;

(v) Total dollars planned to be subcontracted to HUBZone small business concerns;

(vi) Total dollars planned to be subcontracted to small disadvantaged business concerns; and

(vii) Total dollars planned to be subcontracted to women-owned small business concerns.

(3) A description of the principal types of supplies and services to be subcontracted, and an identification of the types planned for subcontracting to—

(i) Small business concerns;

(ii) Veteran-owned small business concerns;

(iii) Service-disabled veteran-owned small business concerns;

(iv) HUBZone small business concerns;

(v) Small disadvantaged business concerns; and

(vi) Women-owned small business concerns.

(4) A description of the method used to develop the subcontracting goals in paragraph (d)(1) of this clause.

(5) A description of the method used to identify potential sources for solicitation purposes (*e.g.*, existing company source lists, the Procurement Marketing and Access Network (PRO-Net) of the Small Business Administration (SBA), veterans service organizations, the National Minority Purchasing Council Vendor Information Service, the Research and Information Division of the Minority Business Development Agency in the Department of Commerce, or small, HUBZone, small disadvantaged, and women-owned small business trade associations). A firm may rely on the information contained in PRO-Net as an accurate representation of a concern's size and ownership characteristics for the purposes of maintaining a small, veteran-owned small, service-disabled veteran-owned small, HUBZone small, small disadvantaged, and women-owned small business source list. Use of PRO-Net as its source list does not relieve a firm of its responsibilities (*e.g.*, outreach, assistance, counseling, or publicizing subcontracting opportunities) in this clause.

(6) A statement as to whether or not the offeror included indirect costs in establishing subcontracting goals, and a description of the method used to determine the proportionate share of indirect costs to be incurred with—

- (i) Small business concerns;
- (ii) Veteran-owned small business concerns;
- (iii) Service-disabled veteran-owned small business concerns;
- (iv) HUBZone small business concerns;
- (v) Small disadvantaged business concerns; and
- (vi) Women-owned small business concerns.

(7) The name of the individual employed by the offeror who will administer the offeror's subcontracting program, and a description of the duties of the individual.

(8) A description of the efforts the offeror will make to assure that small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns have an equitable opportunity to compete for subcontracts.

(9) Assurances that the offeror will include the clause of this contract entitled "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, and that the offeror will require all subcontractors (except small business concerns) that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction of any public facility) to adopt a subcontracting plan that complies with the requirements of this clause.

(10) Assurances that the offeror will—

- (i) Cooperate in any studies or surveys as may be required;
- (ii) Submit periodic reports so that the Government can determine the extent of compliance by the offeror with the subcontracting plan;
- (iii) Submit Standard Form (SF) 294, Subcontracting Report for Individual Contracts, and/or SF 295, Summary Subcontract Report, in accordance with paragraph (j) of this clause. The reports shall provide information on subcontract awards to small business concerns, veteran-owned small business concerns, service-disabled veteran-owned small business concerns, HUBZone small business concerns, small disadvantaged business concerns, women-owned small business concerns, and Historically Black Colleges and Universities and Minority Institutions. Reporting shall be in accordance with the instructions on the forms or as provided in agency regulations.

- (iv) Ensure that its subcontractors agree to submit SF 294 and SF 295.

(11) A description of the types of records that will be maintained concerning procedures that have been adopted to comply with the requirements and goals in the plan, including establishing source lists; and a description of the offeror's efforts to locate small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns and award subcontracts to them. The records shall include at least the following (on a plant-wide or company-wide basis, unless otherwise indicated):

- (i) Source lists (*e.g.*, PRO-Net), guides, and other data that identify small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns.

- (ii) Organizations contacted in an attempt to locate sources that are small business,

veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, or women-owned small business concerns.

(iii) Records on each subcontract solicitation resulting in an award of more than \$100,000, indicating—

- (A) Whether small business concerns were solicited and, if not, why not;
- (B) Whether veteran-owned small business concerns were solicited and, if not, why not;
- (C) Whether service-disabled veteran-owned small business concerns were solicited and, if not, why not;
- (D) Whether HUBZone small business concerns were solicited and, if not, why not;
- (E) Whether small disadvantaged business concerns were solicited and, if not, why not;
- (F) Whether women-owned small business concerns were solicited and, if not, why not; and
- (G) If applicable, the reason award was not made to a small business concern.

(iv) Records of any outreach efforts to contact—

- (A) Trade associations;
- (B) Business development organizations;
- (C) Conferences and trade fairs to locate small, HUBZone small, small disadvantaged, and women-owned small business sources; and
- (D) Veterans service organizations.

(v) Records of internal guidance and encouragement provided to buyers through—

- (A) Workshops, seminars, training, etc.; and
- (B) Monitoring performance to evaluate compliance with the program's requirements.

(vi) On a contract-by-contract basis, records to support award data submitted by the offeror to the Government, including the name, address, and business size of each subcontractor. Contractors having commercial plans need not comply with this requirement.

(e) In order to effectively implement this plan to the extent consistent with efficient contract performance, the Contractor shall perform the following functions:

(1) Assist small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns by arranging solicitations, time for the preparation of bids, quantities, specifications, and delivery schedules so as to facilitate the participation by such concerns. Where the Contractor's lists of potential small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business subcontractors are excessively long, reasonable effort shall be made to give all such small business concerns an opportunity to compete over a period of time.

(2) Provide adequate and timely consideration of the potentialities of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business concerns in all "make-or-buy" decisions.

(3) Counsel and discuss subcontracting opportunities with representatives of small business, veteran-owned small business, service-disabled veteran-owned small business, HUBZone small business, small disadvantaged business, and women-owned small business firms.

(4) Provide notice to subcontractors concerning penalties and remedies for misrepresentations of business status as small, veteran-owned small business, HUBZone small, small disadvantaged, or women-owned small business for the purpose of obtaining a subcontract that is to be included as part or all of a goal contained in the Contractor's subcontracting plan.

(f) A master plan on a plant or division-wide basis that contains all the elements required by paragraph (d) of this clause, except goals, may be incorporated by reference as a part of the subcontracting plan required of the offeror by this clause; provided —

- (1) The master plan has been approved;
- (2) The offeror ensures that the master plan is updated as necessary and provides copies of the approved master plan, including evidence of its approval, to the Contracting Officer; and

(3) Goals and any deviations from the master plan deemed necessary by the Contracting Officer to satisfy the requirements of this contract are set forth in the individual subcontracting plan.

(g) A commercial plan is the preferred type of subcontracting plan for contractors furnishing commercial items. The commercial plan shall relate to the offeror's planned subcontracting generally, for both commercial and Government business, rather than solely to the Government contract. Commercial plans are also preferred for subcontractors that provide commercial items under a prime contract, whether or not the prime contractor is supplying a commercial item.

(h) Prior compliance of the offeror with other such subcontracting plans under previous contracts will be considered by the Contracting Officer in determining the responsibility of the offeror for award of the contract.

(i) The failure of the Contractor or subcontractor to comply in good faith with—

(1) The clause of this contract entitled "Utilization Of Small Business Concerns;" or

(2) An approved plan required by this clause, shall be a material breach of the contract.

(j) The Contractor shall submit the following reports:

(1) *Standard Form 294, Subcontracting Report for Individual Contracts*. This report shall be submitted to the Contracting Officer semiannually and at contract completion. The report covers subcontract award data related to this contract. This report is not required for commercial plans.

(2) *Standard Form 295, Summary Subcontract Report*. This report encompasses all of the contracts with the awarding agency. It must be submitted semi-annually for contracts with the Department of Defense and annually for contracts with civilian agencies. If the reporting activity is covered by a commercial plan, the reporting activity must report annually all subcontract awards under that plan. All reports submitted at the close of each fiscal year (both individual and commercial plans) shall include a breakout, in the Contractor's format, of subcontract awards, in whole dollars, to small disadvantaged business concerns by North American Industry Classification System (NAICS) Industry Subsector. For a commercial plan, the Contractor may obtain from each of its subcontractors a predominant NAICS Industry Subsector and report all awards to that subcontractor under its predominant NAICS Industry Subsector.

(End of clause)

25. DFARS 252.219-7009 SECTION 8(a) DIRECT AWARD (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]

(a) This contract is issued as a direct award between the contracting office and the 8(a) Contractor pursuant to the Memorandum of Understanding dated May 6, 1998, between the Small Business Administration (SBA) and the Department of Defense. Accordingly, the SBA is not a party to this contract. SBA does retain responsibility for 8(a) certification, for 8(a) eligibility determinations and related issues, and for providing counseling and assistance to the 8(a) Contractor under the 8(a) Program. The cognizant SBA district office is:

[To be completed by the Contracting Officer at the time of award]

(b) The contracting office is responsible for administering the contract and for taking any action on behalf of the Government under the terms and conditions of the contract; provided that the contracting office shall give advance notice to the SBA before it issues a final notice terminating performance, either in whole or in part, under the contract. The contracting office also shall coordinate with the SBA prior to processing any novation agreement. The contracting office may assign contract administration functions to a contract administration office.

(c) The Contractor agrees that--

(1) It will notify the Contracting Officer, simultaneous with its notification to the SBA (as required by SBA's 8(a) regulations at 13 CFR 124.308), when the owner or owners upon whom 8(a) eligibility is based plan to relinquish ownership or control of the concern. Consistent with Section 407 of Pub. L. 100-656, transfer of ownership or control shall result in termination of the contract for convenience, unless the SBA waives the requirement for termination prior to the actual relinquishing of ownership and control; and

(2) It will not subcontract the performance of any of the requirements of this contract without the prior written approval of the SBA and the Contracting Officer.

(End of clause)

26. *FAR 52.219-14 LIMITATIONS ON SUBCONTRACTING (DEC 1996) [For Small Business Set Aside Only]

- (a) This clause does not apply to the unrestricted portion of a partial set-aside.
- (b) By submission of an offer and execution of a contract, the Offeror/Contractor agrees that in performance of the contract in the case of a contract for--
 - (1) Services (except construction). At least 50 percent of the cost of contract performance incurred for personnel shall be expended for employees of the concern.
 - (2) Supplies (other than procurement from a nonmanufacturer of such supplies). The concern shall perform work for at least 50 percent of the cost of manufacturing the supplies, not including the cost of materials.
 - (3) General construction. The concern will perform at least 15 percent of the cost of the contract, not including the cost of materials, with its own employees.
 - (4) Construction by special trade contractors. The concern will perform at least 25 percent of the cost of the contract, not including the cost of materials, with its own employees.

27. *FAR 52.219-16 LIQUIDATED DAMAGES-SUBCONTRACTING PLAN (JAN 1999)

(a) Failure to make a good faith effort to comply with the subcontracting plan, as used in this clause, means a willful or intentional failure to perform in accordance with the requirements of the subcontracting plan approved under the clause in this contract entitled ``Small Business Subcontracting Plan," or willful or intentional action to frustrate the plan.

(b) Performance shall be measured by applying the percentage goals to the total actual subcontracting dollars or, if a commercial plan is involved, to the pro rata share of actual subcontracting dollars attributable to Government contracts covered by the commercial plan., If, at contract completion, or in the case of a commercial plan, at the close of the fiscal year for which the plan is applicable, the Contractor has failed to meet its subcontracting goals and the Contracting Officer decides in accordance with paragraph (c) of this clause that the Contractor failed to make a good faith effort to comply with its subcontracting plan, established in accordance with the clause in this contract entitled ``Small Business Subcontracting Plan," the Contractor shall pay the Government liquidated damages in an amount stated. The amount of probable damages attributable to the Contractor's failure to comply shall be an amount equal to the actual dollar amount by which the Contractor failed to achieve each subcontract goal.

(c) Before the Contracting Officer makes a final decision that the Contractor has failed to make such good faith effort, the Contracting Officer shall give the Contractor written notice specifying the failure and permitting the Contractor to demonstrate what good faith efforts have been made and to discuss the matter. Failure to respond to the notice may be taken as an admission that no valid explanation exists. If, after consideration of all the pertinent data, the Contracting Officer finds that the Contractor failed to make a good faith effort to comply with the subcontracting plan, the Contracting Officer shall issue a final decision to that effect and require that the Contractor pay the Government liquidated damages as provided in paragraph (b) of this clause.

(d) With respect to commercial plans, the Contracting Officer who approved the plan will perform the functions of the Contracting Officer under this clause on behalf of all agencies with contracts covered by a commercial plan.

(e) The Contractor shall have the right of appeal, under the clause in this contract entitled, Disputes, from many final decision of the Contracting Officer.

(f) Liquidated damages shall be in addition to any other remedies that the Government may have.

28. DFARS 252.219-7010 ALTERNATE A (JUN 1998) [When Competitive 8(a) Contracting Procedures are used]

As prescribed in 219.811-3(2), substitute the following paragraph (c) for paragraph (c) of the clause at FAR 52.219-18:

(c) Any award resulting from this solicitation will be made directly by the Contracting Officer to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

29. FAR 52.219-18 NOTIFICATION OF COMPETITION LIMITED TO ELIGIBLE 8(A) CONCERNS (JUNE 1999) [When Competitive 8(a) Contracting Procedures are used]

(a) Offers are solicited only from small business concerns expressly certified by the Small Business Administration (SBA) for participation in the SBA's 8(a) Program and which meet the following criteria at the time of submission of offer--

(1) The Offeror is in conformance with the 8(a) support limitation set forth in its approved business plan; and

(2) The Offeror is in conformance with the Business Activity Targets set forth in its approved business plan or any remedial action directed by the SBA.

(b) By submission of its offer, the Offeror represents that it meets all of the criteria set forth in paragraph (a) of this clause.

(c) Any award resulting from this solicitation will be made to the Small Business Administration, which will subcontract performance to the successful 8(a) offeror selected through the evaluation criteria set forth in this solicitation.

(d) (1) Agreement. A small business concern submitting an offer in its own name agrees to furnish, in performing the contract, only end items manufactured or produced by small business concerns in the United States. The term "United States" includes its territories and possessions, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia. If this procurement is processed under simplified acquisition procedures and the total amount of this contract does not exceed \$25,000, a small business concern may furnish the product of any domestic firm. This subparagraph does not apply in connection with construction or service contracts.

(2) The [insert name of SBA's contractor] will notify the U.S. Army Corps of Engineers Contracting Officer in writing immediately upon entering an agreement (either oral or written) to transfer all or part of its stock or other ownership interest to any other party.

(End of clause)

30. DFARS 252.219-7003 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (DOD CONTRACTS) (APR 1996)

This clause supplements the Federal Acquisition Regulation 52.219-9, Small, Small Disadvantaged and Women-Owned Small Business Subcontracting Plan, clause of this contract.

(a) Definitions.

"Historically black colleges and universities," as used in this clause, means institutions determined by the Secretary of Education to meet the requirements of 34 CFR Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university before November 14, 1986.

"Minority institutions," as used in this clause, means institutions meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in Section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1)).

(b) Except for company or division-wide commercial products subcontracting plans, the term "small disadvantaged business," when used in the FAR 52.219-9 clause, includes historically black colleges and universities and minority institutions in addition to small disadvantaged business concerns.

(c) Work under the contract or its subcontracts shall be credited toward meeting the small disadvantaged business concern goal required by paragraph (d) of the FAR 52.219-9 clause when:

(1) It is performed on Indian lands or in joint venture with an Indian tribe or a tribally-owned corporation, and

(2) It meets the requirements of 10 U.S.C. 2323a.

(d) Subcontracts awarded to workshops approved by the Committee for Purchase from People Who are Blind or Severely Disabled (41 U.S.C. 46-48), may be counted toward the Contractor's small business subcontracting goal.

(e) A mentor firm, under the Pilot Mentor-Protege Program established under Section 831 of Pub. L. 101-510, as amended, may count toward its small disadvantaged business goal, subcontracts awarded--

(1) Protege firms which are qualified organizations employing the severely handicapped; and

(2) Former protege firms that meet the criteria in Section 831(g)(4) of Pub. L. 101-510.

(f) The master plan approval referred to in paragraph (f) of the FAR 52.219-9 clause is approval by the Contractor's cognizant contract administration activity.

(g) In those subcontracting plans which specifically identify small, small disadvantaged, and women-owned businesses, the Contractor shall notify the Administrative Contracting Officer of any substitutions of firms that are not small, small disadvantaged, or women-owned small businesses for the firms listed in the subcontracting plan. Notifications shall be in writing and shall occur within a reasonable period of time after award of the subcontract. Contractor-specified formats shall be acceptable.

31. DFARS 252.219-7004 SMALL, SMALL DISADVANTAGED AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (TEST PROGRAM) (JUN 1997)

(a) Definition. "Subcontract," as used in this clause, means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime Contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

(b) The Offeror's comprehensive small business subcontracting plan and its successors, which are authorized by and approved under the test program of Section 834 of Pub. L. 101-189, shall be included in and made a part of the resultant contract. Upon expulsion from the test program or expiration of the test program, the Contractor shall negotiate an individual subcontracting plan for all future contracts that meet the requirements of Section 211 of Publ. L. 95-507.

(c) The Contractor shall submit Standard Form 295, Summary Subcontract Report, in accordance with the instructions on the form, except--

(1) One copy of SF 295 and attachments shall be submitted to Director, Small and Disadvantaged Business Utilization, Office of the Deputy Under Secretary of Defense (International and Commercial Programs), 3061 Defense Pentagon, Room 2A338, Washington, DC 20301-3061; and

(2) Item 14, Remarks, shall be completed to include semi-annual cumulative--

(1) Small business, small disadvantaged business and women-owned small business goals; and

(2) Small business and small disadvantaged business goals, actual accomplishments, and percentages for each of the two designated industry categories.

(d) The failure of the Contractor or subcontractor to comply in good faith with (1) the clause of this contract entitled "Utilization of Small, Small Disadvantaged and Women-Owned Small Business Concerns," or (2) an approved plan required by this clause, shall be a material breach of the contract.

32. *FAR 52.222-3 CONVICT LABOR (AUG 1996)

The Contractor agrees not to employ in the performance of this contract any person undergoing a sentence of imprisonment which has been imposed by any court of a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands. This limitation, however, shall not prohibit the employment by the Contractor in the performance of this contract of persons on parole or probation to work at paid employment during the term of their sentence or persons who have been pardoned or who have served their terms. Nor shall it prohibit the employment by the Contractor in the performance of this contract of persons confined for violation of the laws of any of the States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands, or the Trust Territory of the Pacific Islands who are authorized to work at paid employment in the community under the laws of such jurisdiction, if--

- (a) (1) The worker is paid or is in an approved work training program on a voluntary basis;
 - (2) Representatives of local union central bodies or similar labor union organizations have been consulted;
 - (3) Such paid employment will not result in the displacement of employed workers, or be applied in skills, crafts, or trades in which there is a surplus of available gainful labor in the locality, or impair existing contracts for services; and
 - (4) The rates of pay and other conditions of employment will not be less than those paid or provided for work of a similar nature in the locality in which the work is being performed; and
- (b) The Attorney General of the United States has certified that the work-release laws or regulations of the jurisdiction involved are in conformity with the requirements of Executive Order 11755, as amended by Executive Orders 12608 and 12943.

33. *FAR 52.222-4 CONTRACT WORK HOURS AND SAFETY STANDARDS ACT—OVERTIME COMPENSATION (SEPT 2000)

(a) *Overtime requirements.* No Contractor or subcontractor employing laborers or mechanics (see Federal Acquisition Regulation 22.300) shall require or permit them to work over 40 hours in any workweek unless they are paid at least 1 and 1/2 times the basic rate of pay for each hour worked over 40 hours.

(b) *Violation; liability for unpaid wages; liquidated damages.* The responsible Contractor and subcontractor are liable for unpaid wages if they violate the terms in paragraph (a) of this clause. In addition, the Contractor and subcontractor are liable for liquidated damages payable to the Government. The Contracting Officer will assess liquidated damages at the rate of \$10 per affected employee for each calendar day on which the employer required or permitted the employee to work in excess of the standard workweek of 40 hours without paying overtime wages required by the Contract Work Hours and Safety Standards Act.

(c) *Withholding for unpaid wages and liquidated damages.* The Contracting Officer will withhold from payments due under the contract sufficient funds required to satisfy any Contractor or subcontractor liabilities for unpaid wages and liquidated damages. If amounts withheld under the contract are insufficient to satisfy Contractor or subcontractor liabilities, the Contracting Officer will withhold payments from other Federal or Federally assisted contracts held by the same Contractor that are subject to the Contract Work Hours and Safety Standards Act.

(d) *Payrolls and basic records.* (1) The Contractor and its subcontractors shall maintain payrolls and basic payroll records for all laborers and mechanics working on the contract during the contract and shall make them available to the Government until 3 years after contract completion. The records shall contain the name and address of each employee, social security number, labor classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. The records need not duplicate those required for construction work by Department of Labor regulations at 29 CFR 5.5(a)(3) implementing the Davis-Bacon Act .

(2) The Contractor and its subcontractors shall allow authorized representatives of the Contracting Officer or the Department of Labor to inspect, copy, or transcribe records maintained under paragraph (d)(1) of this clause. The Contractor or subcontractor also shall allow authorized representatives of the Contracting Officer or

Department of Labor to interview employees in the workplace during working hours.

(e) *Subcontracts*. The Contractor shall insert the provisions set forth in paragraphs (a) through (d) of this clause in subcontracts exceeding \$100,000 and require subcontractors to include these provisions in any lower-tier subcontracts. The Contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the provisions set forth in paragraphs (a) through (d) of this clause.

(End of clause)

34. *FAR 52.222-6 DAVIS-BACON ACT (FEB 1995)

(a) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (d) of this clause; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such period. Such laborers and mechanics shall be paid not less than the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in the clause entitled Apprentices and Trainees. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph (b) of this clause) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(b) (1) The Contracting Officer shall require that any class of laborers or mechanics, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Contracting Officer shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination.

(ii) The classification is utilized in the area by the construction industry.

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the Contractor and laborers and mechanics to be employed in the classification (if known), or their representatives, and the Contracting Officer agree on the classification and wage rate (including the amount designated for fringe benefits, where appropriate), a report of the action taken shall be sent by the Contracting Officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator or an authorized representative will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(3) In the event the Contractor, the laborers or mechanics to be employed in the classification, or their representatives, and the Contracting Officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the Contracting Officer shall refer the questions, including the views of all interested parties and the recommendation of the Contracting Officer, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the Contracting Officer or will notify the Contracting Officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits, where appropriate) determined pursuant to subparagraphs (b)(2) and (b)(3) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(c) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(d) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

35. *FAR 52.222-7 WITHHOLDING OF FUNDS (FEB 1988)

The Contracting Officer shall, upon his or her own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

36. *FAR 52.222-8 PAYROLLS AND BASIC RECORDS (FEB 1988)

(a) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of 3 years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under paragraph (d) of the clause entitled Davis-Bacon Act, that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(b) (1) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under paragraph (a) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. The Prime Contractor is responsible for the submission of copies of payrolls by all subcontractors.

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify--

(i) That the payroll for the payroll period contains the information required to be maintained under paragraph (a) of this clause and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR Part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph (b)(2) of this clause.

(4) The falsification of any of the certifications in this clause may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(c) The Contractor or subcontractor shall make the records required under paragraph (a) of this clause available for inspection, copying, or transcription by the Contracting Officer or authorized representatives of the Contracting Officer or the Department of Labor. The Contractor or subcontractor shall permit the Contracting Officer or representatives of the Contracting Officer or the Department of Labor to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit required records or to make them available, the Contracting Officer may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

37. *FAR 52.222-9 APPRENTICES AND TRAINEES (FEB 1988)

(a) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will not longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(b) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(c) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

38. *FAR 52.222-10 COMPLIANCE WITH COPELAND ACT REQUIREMENTS (FEB 1988)

The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

39. *FAR 52.222-11 SUBCONTRACTS (LABOR STANDARDS) (FEB 1988)

(a) The Contractor or subcontractor shall insert in any subcontracts the clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Withholding of Funds, Subcontracts (Labor Standards), Contract Termination--Debarment, Disputes Concerning Labor Standards, Compliance with Davis-Bacon and Related Act Regulations, and Certification of Eligibility, and such other clauses as the Contracting Officer may, by appropriate instructions, require, and also a clause requiring subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses cited in this paragraph.

(b) (1) Within 14 days after award of the contract, the Contractor shall deliver to the Contracting Officer a completed Statement and Acknowledgment Form (SF 1413) for each subcontract, including the subcontractor's signed and dated acknowledgment that the clauses set forth in paragraph (a) of this clause have been included in the subcontract.

(2) Within 14 days after the award of any subsequently awarded subcontract the Contractor shall deliver to the Contracting Officer an updated completed SF 1413 for such additional subcontract.

40. *FAR 52.222-12 CONTRACT TERMINATION--DEBARMENT (FEB 1988)

A breach of the contract clauses entitled Davis-Bacon Act, Contract Work Hours and Safety Standards Act--Overtime Compensation, Apprentices and Trainees, Payrolls and Basic Records, Compliance with Copeland Act Requirements, Subcontracts (Labor Standards), Compliance with Davis-Bacon and Related Act Regulations, or

Certification of Eligibility may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 CFR 5.12.

41. *FAR 52.222-13 COMPLIANCE WITH DAVIS-BACON AND RELATED ACT REGULATIONS (FEB 1988)

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are hereby incorporated by reference in this contract.

42. *FAR 52.222-14 DISPUTES CONCERNING LABOR STANDARDS (FEB 1988)

The United States Department of Labor has set forth in 29 CFR Parts 5, 6, and 7 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency the U.S. Department of Labor, or the employees of their representatives.

43. *FAR 52.222-15 CERTIFICATION OF ELIGIBILITY (FEB 1988)

(a) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

44. *FAR 52.222-26 EQUAL OPPORTUNITY (FEB 1999)

(a) If, during any 12-month period (including the 12 months preceding the award of this contract), the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with subparagraphs (b)(1) through (11) of this clause. Upon request, the Contractor shall provide information necessary to determine the applicability of this clause.

(b) During performing this contract, the Contractor agrees as follows:

(1) The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. However, it shall not be a violation of this clause for the Contractor to extend a publicly announced preference in employment to Indians living on or near an Indian reservation, in connection with employment opportunities on or near an Indian reservation, as permitted by 41 CFR 60-1.5.

(2) The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, or national origin. This shall include, but not be limited to, (i) employment, (ii) upgrading, (iii) demotion, (iv) transfer, (v) recruitment or recruitment advertising, (vi) layoff or termination, (vii) rates of pay or other forms of compensation, and (viii) selection for training, including apprenticeship.

(3) The Contractor shall post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer that explain this clause.

(4) The Contractor shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(5) The Contractor shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.

(6) The Contractor shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.

(7) The Contractor shall furnish to the contracting agency all information required by Executive Order 11246, as amended, and by the rules, regulations, and orders of the Secretary of Labor. The Contractor shall also file Standard Form 100 (EEO-1), or any successor form, as prescribed in 41 CFR part 60-1. Unless the Contractor has filed within the 12 months preceding the date of contract award, the Contractor shall, within 30 days after contract award, apply to either the regional Office of Federal Contract Compliance Programs (OFCCP) or the local office of the Equal Employment Opportunity Commission for the necessary forms.

(8) The Contractor shall permit access to its premises, during normal business hours, by the contracting agency or the OFCCP for the purpose of conducting on-site compliance evaluations and complaint investigations. The Contractor shall permit the Government to inspect and copy any books, accounts, records (including computerized records), and other material that may be relevant to the matter under investigation and pertinent to compliance with Executive Order 11246, as amended, and rules and regulations that implement the Executive Order.

(9) If the OFCCP determines that the Contractor is not in compliance with this clause or any rule, regulation, or order of the Secretary of Labor, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts, under the procedures authorized in Executive Order 11246, as amended. In addition, sanctions may be imposed and remedies invoked against the Contractor as provided in Executive Order 11246, as amended; in the the rules, regulations, and orders of the Secretary of Labor; or as otherwise provided by law.

(10) The Contractor shall include the terms and conditions of subparagraph (b)(1) through (11) of this clause in every subcontract or purchase order that is not exempted by the rules, regulations, or orders of the Secretary of Labor issued under Executive Order 11246, as amended, so that these terms and conditions will be binding upon each subcontractor or vendor.

(11) The Contractor shall take such action with respect to any subcontract or purchase order as the Contracting Officer may direct as a means of enforcing these terms and conditions ,including sanctions for noncompliance; provided, that if the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of any direction, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

(c) Notwithstanding any other clause in this contract, disputes relative to this clause will be governed by the procedures in 41 CFR 60-1.1.

45. *FAR 52.222-27 AFFIRMATIVE ACTION COMPLIANCE REQUIREMENTS FOR CONSTRUCTION (FEB 1999)

(a) Definitions.

"Covered area," as used in this clause, means the geographical area described in the solicitation for this contract.

"Deputy Assistant Secretary," as used in this clause, means the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, or a designee

"Employer's identification number," as used in this clause, means the Federal Social Security number used on the employer's quarterly Federal tax return, U.S. Treasury Department Form 941.

"Minority," as used in this clause, means--

(1) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

(2) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands);

(3) Black (all persons having origins in any of the black African racial groups not of Hispanic origin); and

(4) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

(b) If the Contractor, or a subcontractor at any tier, subcontracts a portion of the work involving any construction trade each such subcontract in excess of \$10,000 shall include this clause and the Notice containing the goals for minority and female participation stated in the solicitation for this contract.

(c) If the Contractor is participating in a Hometown Plan (41 CFR 60-4) approved by the U.S. Department of Labor in a covered area, either individually or through an association, its affirmative action obligations on all work in the plan area (including goals) shall comply with the plan for those trades that have unions participating in the plan. Contractors must be able to demonstrate participation in, and compliance with, the provisions of the plan. Each Contractor or subcontractor participating in an approved plan is also required to comply with its obligations under the Equal Opportunity clause, and to make a good faith effort to achieve each goal under the plan in each trade in which it has employees. The overall good-faith performance by other Contractors or subcontractors toward a goal in an approved plan does not excuse any Contractor's or subcontractor's failure to make good-faith efforts to achieve the plan's goals.

(d) The Contractor shall implement the affirmative action procedures in subparagraphs (g)(1) through (16) of this clause. The goals stated in the solicitation for this contract are expressed as percentages of the total hours of employment and training of minority and female utilization that the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where that work is actually performed. The Contractor is expected to make substantially uniform progress toward its goals in each craft.

(e) Neither the terms and conditions of any collective bargaining agreement, nor the failure by a union with which the Contractor has a collective bargaining agreement, to refer minorities or women shall excuse the Contractor's obligations under this clause, Executive Order 11246, as amended, or the regulations thereunder.

(f) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

(g) The Contractor shall take affirmative action to ensure equal employment opportunity. The evaluation of the Contractor's compliance with this clause shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and implement affirmative action steps at least as extensive as the following:

(1) Ensure a working environment free of harassment, intimidation, and coercion at all sites and in all facilities where the Contractor's employees are assigned to work. The Contractor, if possible, will assign two or more women to each construction project. The Contractor shall ensure that foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at these sites or facilities.

(2) Establish and maintain a current list of sources for minority and female recruitment. Provide written notification to minority and female recruitment sources and community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

(3) Establish and maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant, referrals of minorities or females from unions, recruitment sources, or community organizations, and the action taken with respect to each individual. If an individual was sent to the union hiring hall for referral and not referred back to the Contractor by the union or, if referred back, not employed by the Contractor, this shall be documented in the file, along with whatever additional actions the Contractor may have taken.

(4) Immediately notify the Deputy Assistant Secretary when the union or unions with which the Contractor has a collective bargaining agreement has not referred back to the Contractor a minority or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

(5) Develop on-the-job training opportunities and/or participate in training programs for the area that expressly include minorities and women, including upgrading programs and apprenticeship and trainee

programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under subparagraph (g)(2) of this clause.

- (6) Disseminate the Contractor's equal employment policy by--
 - (i) Providing notice of the policy to unions and to training, recruitment, and outreach programs, and requesting their cooperation in assisting the Contractor in meeting its contract obligations;
 - (ii) Including the policy in any policy manual and in collective bargaining agreements;
 - (iii) Publicizing the policy in the company newspaper, annual report, etc.;
 - (iv) Reviewing the policy with all management personnel and with all minority and female employees at least once a year; and
 - (v) Posting the policy on bulletin boards accessible to employees at each location where construction work is performed.
- (7) Review, at least annually, the Contractor's equal employment policy and affirmative action obligations with all employees having responsibility for hiring, assignment, layoff, termination, or other employment decisions. Conduct review of this policy with all on-site supervisory personnel before initiating construction work at a job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- (8) Disseminate the Contractor's equal employment policy externally by including it in any advertising in the news media, specifically including minority and female news media. Provide written notification to, and discuss this policy with, other Contractors and subcontractors with which the Contractor does or anticipates doing business.
- (9) Direct recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students, and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than 1 month before the date for acceptance of applications for apprenticeship or training by any recruitment source, send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- (10) Encourage present minority and female employees to recruit minority persons and women. Where reasonable, provide after-school, summer, and vacation employment to minority and female youth both on the site and in other areas of the Contractor's workforce.
- (11) Validate all tests and other selection requirements where required under 41 CFR 60-3.
- (12) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities. Encourage these employees to seek or to prepare for, through appropriate training, etc., opportunities for promotion.
- (13) Ensure that seniority practices job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the Contractor's obligations under this contract are being carried out.
- (14) Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- (15) Maintain a record of solicitations for subcontracts for minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- (16) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's equal employment policy and affirmative action obligations.
- (h) The Contractor is encouraged to participate in voluntary associations that may assist in fulfilling one or more of the affirmative action obligations contained in subparagraphs (g)(1) through (16) of this clause. The efforts of a contractor association, joint contractor-union, contractor-community, or similar group of which the contractor is a member and participant may be asserted as fulfilling one or more of its obligations under subparagraphs (g)(1) through (16) of this clause, provided the Contractor--
 - (1) Actively participates in the group;
 - (2) Makes every effort to ensure that the group has a positive impact on the employment of minorities and women in the industry;

(3) Ensures that concrete benefits of the program are reflected in the Contractor's minority and female workforce participation;

(4) Makes a good-faith effort to meet its individual goals and timetables; and

(5) Can provide access to documentation that demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply is the Contractor's, and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

(i) A single goal for minorities and a separate single goal for women shall be established. The Contractor is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and nonminority. Consequently, the Contractor may be in violation of Executive Order 11246, as amended, if a particular group is employed in a substantially disparate manner.

(j) The Contractor shall not use goals or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

(k) The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts under Executive Order 11246, as amended.

(l) The Contractor shall carry out such sanctions and penalties for violation of this clause and of the Equal Opportunity clause, including suspension, termination, and cancellation of existing subcontracts, as may be imposed or ordered under Executive Order 11246, as amended, and its implementing regulations, by the OFCCP. Any failure to carry out these sanctions and penalties as ordered shall be a violation of this clause and Executive Order 11246, as amended.

(m) The Contractor in fulfilling its obligations under this clause shall implement affirmative action procedures at least as extensive as those prescribed in paragraph (g) of this clause, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of Executive Order 11246, as amended, the implementing regulations, or this clause, the Deputy Assistant Secretary shall take action as prescribed in 41 CFR 60-4.8.

(n) The Contractor shall designate a responsible official to--

(1) Monitor all employment-related activity to ensure that the Contractor's equal employment policy is being carried out;

(2) Submit reports as may be required by the Government; and

(3) Keep records that shall at least include for each employee the name, address, telephone number, construction trade, union affiliation (if any), employee identification number, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, separate records are not required to be maintained.

(o) Nothing contained herein shall be construed as a limitation upon the application of other laws that establish different standards of compliance or upon the requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

46. *FAR 52.222-35 EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) *Definitions.* As used in this clause—

“All employment openings” means all positions except executive and top management, those positions that will be filled from within the Contractor's organization, and positions lasting 3 days or less. This term includes full-time employment, temporary employment of more than 3 days duration, and part-time employment.

“Executive and top management” means any employee—

(1) Whose primary duty consists of the management of the enterprise in which the individual is employed or of a customarily recognized department or subdivision thereof;

(2) Who customarily and regularly directs the work of two or more other employees;

(3) Who has the authority to hire or fire other employees or whose suggestions and recommendations as to the hiring or firing and as to the advancement and promotion or any other change of status of

other employees will be given particular weight;

(4) Who customarily and regularly exercises discretionary powers; and

(5) Who does not devote more than 20 percent or, in the case of an employee of a retail or service establishment, who does not devote more than 40 percent of total hours of work in the work week to activities that are not directly and closely related to the performance of the work described in paragraphs

(1) through (4) of this definition. This paragraph (5) does not apply in the case of an employee who is in sole charge of an establishment or a physically separated branch establishment, or who owns at least a 20 percent interest in the enterprise in which the individual is employed.

“Other eligible veteran” means any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

“Positions that will be filled from within the Contractor's organization” means employment openings for which the Contractor will give no consideration to persons outside the Contractor's organization (including any affiliates, subsidiaries, and parent companies) and includes any openings the Contractor proposes to fill from regularly established “recall” lists. The exception does not apply to a particular opening once an employer decides to consider applicants outside of its organization.

“Qualified special disabled veteran” means a special disabled veteran who satisfies the requisite skill, experience, education, and other job-related requirements of the employment position such veteran holds or desires, and who, with or without reasonable accommodation, can perform the essential functions of such position.

“Special disabled veteran” means—

(1) A veteran who is entitled to compensation (or who but for the receipt of military retired pay would be entitled to compensation) under laws administered by the Department of Veterans Affairs for a disability—

(i) Rated at 30 percent or more; or

(ii) Rated at 10 or 20 percent in the case of a veteran who has been determined under 38 U.S.C. 3106 to have a serious employment handicap (*i.e.*, a significant impairment of the veteran's ability to prepare for, obtain, or retain employment consistent with the veteran's abilities, aptitudes, and interests); or

(2) A person who was discharged or released from active duty because of a service-connected disability.

“Veteran of the Vietnam era” means a person who—

(1) Served on active duty for a period of more than 180 days and was discharged or released from active duty with other than a dishonorable discharge, if any part of such active duty occurred—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases; or

(2) Was discharged or released from active duty for a service-connected disability if any part of the active duty was performed—

(i) In the Republic of Vietnam between February 28, 1961, and May 7, 1975; or

(ii) Between August 5, 1964, and May 7, 1975, in all other cases.

(b) *General.* (1) The Contractor shall not discriminate against the individual because the individual is a special disabled veteran, a veteran of the Vietnam era, or other eligible veteran, regarding any position for which the employee or applicant for employment is qualified. The Contractor shall take affirmative action to employ, advance in employment, and otherwise treat qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans without discrimination based upon their disability or veterans' status in all employment practices such as—

(i) Recruitment, advertising, and job application procedures;

(ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff and rehiring;

(iii) Rate of pay or any other form of compensation and changes in compensation;

(iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;

(v) Leaves of absence, sick leave, or any other leave;

(vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;

(vii) Selection and financial support for training, including apprenticeship, and on-the-job training under 38 U.S.C. 3687, professional meetings, conferences, and other related activities, and selection for

leaves of absence to pursue training;

(viii) Activities sponsored by the Contractor including social or recreational programs;

and

(ix) Any other term, condition, or privilege of employment.

(2) The Contractor shall comply with the rules, regulations, and relevant orders of the Secretary of Labor issued under the Vietnam Era Veterans' Readjustment Assistance Act of 1972 (the Act), as amended (38 U.S.C. 4211 and 4212).

(c) *Listing openings.* (1) The Contractor shall immediately list all employment openings that exist at the time of the execution of this contract and those which occur during the performance of this contract, including those not generated by this contract, and including those occurring at an establishment of the Contractor other than the one where the contract is being performed, but excluding those of independently operated corporate affiliates, at an appropriate local public employment service office of the State wherein the opening occurs. Listing employment openings with the U.S. Department of Labor's America's Job Bank shall satisfy the requirement to list jobs with the local employment service office.

(2) The Contractor shall make the listing of employment openings with the local employment service office at least concurrently with using any other recruitment source or effort and shall involve the normal obligations of placing a bona fide job order, including accepting referrals of veterans and nonveterans. This listing of employment openings does not require hiring any particular job applicant or hiring from any particular group of job applicants and is not intended to relieve the Contractor from any requirements of Executive orders or regulations concerning nondiscrimination in employment.

(3) Whenever the Contractor becomes contractually bound to the listing terms of this clause, it shall advise the State public employment agency in each State where it has establishments of the name and location of each hiring location in the State. As long as the Contractor is contractually bound to these terms and has so advised the State agency, it need not advise the State agency of subsequent contracts. The Contractor may advise the State agency when it is no longer bound by this contract clause.

(d) *Applicability.* This clause does not apply to the listing of employment openings that occur and are filled outside the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, Guam, the Virgin Islands of the United States, and Wake Island.

(e) *Postings.* (1) The Contractor shall post employment notices in conspicuous places that are available to employees and applicants for employment.

(2) The employment notices shall—

(i) State the rights of applicants and employees as well as the Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified employees and applicants who are special disabled veterans, veterans of the Vietnam era, and other eligible veterans; and

(ii) Be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance Programs, Department of Labor (Deputy Assistant Secretary of Labor), and provided by or through the Contracting Officer.

(3) The Contractor shall ensure that applicants or employees who are special disabled veterans are informed of the contents of the notice (e.g., the Contractor may have the notice read to a visually disabled veteran, or may lower the posted notice so that it can be read by a person in a wheelchair).

(4) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement, or other contract understanding, that the Contractor is bound by the terms of the Act and is committed to take affirmative action to employ, and advance in employment, qualified special disabled veterans, veterans of the Vietnam era, and other eligible veterans.

(f) *Noncompliance.* If the Contractor does not comply with the requirements of this clause, the Government may take appropriate actions under the rules, regulations, and relevant orders of the Secretary of Labor issued pursuant to the Act.

(g) *Subcontracts.* The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor. The Contractor shall act as specified by the Deputy Assistant Secretary of Labor to enforce the terms, including action for noncompliance.

(End of clause)

47. *FAR 52.222-36 AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES (JUN 1998)

(a) General.

(1) Regarding any position for which the employee or applicant for employment is qualified, the Contractor shall not discriminate against any employee or applicant because of physical or mental disability. The Contractor agrees to take affirmative action to employ, advance in employment, and otherwise treat qualified individuals with disabilities without discrimination based upon their physical or mental disability in all employment practices such as--

- (i) Recruitment, advertising, and job application procedures;
- (ii) Hiring, upgrading, promotion, award of tenure, demotion, transfer, layoff, termination, right of return from layoff, and rehiring;
- (iii) Rates of pay or other forms of compensation and changes in compensation;
- (iv) Job assignments, job classifications, organizational structures, position descriptions, lines of progression, and seniority lists;
- (v) Leaves of absence, sick leave, or any other leave;
- (vi) Fringe benefits available by virtue of employment, whether or not administered by the Contractor;
- (vii) Selection and financial support for training, including apprenticeships, professional meetings, conferences, and other related activities, and selection for leaves of absence to pursue training;
- (viii) Activities sponsored by the Contractor, including social or recreational programs; and
- (ix) Any other term, condition, or privilege of employment.

(2) The Contractor agrees to comply with the rules, regulations, and relevant orders of the Secretary of Labor (Secretary) issued under the Rehabilitation Act of 1973 (29 U.S.C. 793) (the Act), as amended.

(b) Postings.

- (1) The Contractor agrees to post employment notices stating--
 - (i) The Contractor's obligation under the law to take affirmative action to employ and advance in employment qualified individuals with disabilities; and
 - (ii) The rights of applicants and employees.
- (2) These notices shall be posted in conspicuous places that are available to employees and applicants for employment. The Contractor shall ensure that applicants and employees with disabilities are informed of the contents of the notice (e.g., the Contractor may have the notice read to visually disabled individual, or may lower the posted notice so that it might be read by a person in a wheelchair). The notices shall be in a form prescribed by the Deputy Assistant Secretary for Federal Contract Compliance of the U.S. Department of Labor (Deputy Assistant Secretary) and shall be provided by or through the Contracting Officer.
- (3) The Contractor shall notify each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, that the Contractor is bound by the terms of Section 503 of the Act and is committed to take affirmative action to employ, and advance in employment, qualified individuals with physical or mental disabilities.
- (c) Noncompliance. If the Contractor does not comply with the requirements of this clause, appropriate actions may be taken under the rules, regulations, and relevant orders of the Secretary issued pursuant to the Act.
- (d) Subcontracts. The Contractor shall include the terms of this clause in every subcontract or purchase order in excess of \$10,000 unless exempted by rules, regulations, or orders of the Secretary. The Contractor shall act as specified by the Deputy Assistant Secretary to enforce the terms, including action for noncompliance.

48. *FAR 52.222-37 EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS (DEC 2001)

(a) Unless the Contractor is a State or local government agency, the Contractor shall report at least annually, as required by the Secretary of Labor, on—

- (1) The number of special disabled veterans, the number of veterans of the Vietnam era, and other

eligible veterans in the workforce of the Contractor by job category and hiring location; and

(2) The total number of new employees hired during the period covered by the report, and of the total, the number of special disabled veterans, the number of veterans of the Vietnam era, and the number of other eligible veterans; and

(3) The maximum number and the minimum number of employees of the Contractor during the period covered by the report.

(b) The Contractor shall report the above items by completing the Form VETS-100, entitled "Federal Contractor Veterans' Employment Report (VETS-100 Report)".

(c) The Contractor shall submit VETS-100 Reports no later than September 30 of each year beginning September 30, 1988.

(d) The employment activity report required by paragraph (a)(2) of this clause shall reflect total hires during the most recent 12-month period as of the ending date selected for the employment profile report required by paragraph (a)(1) of this clause. Contractors may select an ending date—

(1) As of the end of any pay period between July 1 and August 31 of the year the report is due; or

(2) As of December 31, if the Contractor has prior written approval from the Equal Employment Opportunity Commission to do so for purposes of submitting the Employer Information Report EEO-1 (Standard Form 100).

(e) The Contractor shall base the count of veterans reported according to paragraph (a) of this clause on voluntary disclosure. Each Contractor subject to the reporting requirements at 38 U.S.C. 4212 shall invite all special disabled veterans, veterans of the Vietnam era, and other eligible veterans who wish to benefit under the affirmative action program at 38 U.S.C. 4212 to identify themselves to the Contractor. The invitation shall state that—

(1) The information is voluntarily provided;

(2) The information will be kept confidential;

(3) Disclosure or refusal to provide the information will not subject the applicant or employee to any adverse treatment; and

(4) The information will be used only in accordance with the regulations promulgated under 38 U.S.C. 4212.

(f) The Contractor shall insert the terms of this clause in all subcontracts or purchase orders of \$25,000 or more unless exempted by rules, regulations, or orders of the Secretary of Labor.

(End of clause)

49. *FAR 52.222-38 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (DEC 2001)

By submission of its offer, the offeror represents that, if it is subject to the reporting requirements of 38 U.S.C. 4212(d) (*i.e.*, if it has any contract containing Federal Acquisition Regulation clause 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans), it has submitted the most recent VETS-100 Report required by that clause.

(End of provision)

50. *FAR 52.223-5 POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (APR 1998) [For Work on Federal Facilities]

(a) Executive Order 12856 of August 3, 1993, requires Federal facilities to comply with the provisions of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11001-11050) and the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13101-13109).

(b) The Contractor shall provide all information needed by the Federal facility to comply with the emergency planning reporting requirements of Section 302 of EPCRA; the emergency notice requirements of Section 304 of EPCRA; the list of Material Safety Data Sheets required by Section 311 of EPCRA; the emergency and hazardous chemical inventory forms of Section 312 of EPCRA; the toxic chemical release inventory of Section

313 of EPCRA, which includes the reduction and recycling information required by Section 6607 of PPA; and the toxic chemical reduction goals requirements of Section 3-302 of Executive Order 12856.

51. *FAR 52.223-6 DRUG-FREE WORKPLACE (MAY 2001)

(a) Definitions. As used in this clause--

"Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11 - 1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract where employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall--within 30 days after award (unless a longer period is agreed to in writing for contracts of 30 days or more performance duration), or as soon as possible for contracts of less than 30 days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance

programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations

occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause that, as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction.

(5) Notify the Contracting Officer in writing within 10 days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subdivision (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency; and

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance while performing this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraph (b) or (c) of this clause may, pursuant to FAR 23.560, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

52. FAR 52.223-9 ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS (AUG 2000) [For Contracts exceeding \$100,000. EPA Designated product (available at <http://www.epa.gov/cpg/>)]

(a) Definitions. As used in this clause—

“Postconsumer material” means a material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item. Postconsumer material is a part of the broader category of “recovered material.”

“Recovered material” means waste materials and by-products recovered or diverted from solid waste, but the term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.

(b) The Contractor, on completion of this contract, shall—

(1) Estimate the percentage of the total recovered material used in contract performance, including, if applicable, the percentage of postconsumer material content; and

(2) Submit this estimate to the Contracting Officer.

(End of clause)

53. *FAR 52.223-14 TOXIC CHEMICAL RELEASE REPORTING (OCT 2000) [For Contracts Over \$100,000]

(a) Unless otherwise exempt, the Contractor, as owner or operator of a facility used in the performance of this contract, shall file by July 1 for the prior calendar year an annual Toxic Chemical Release Inventory Form (Form R) as described in sections 313(a) and (g) of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) (42 U.S.C. 11023(a) and (g)), and section 6607 of the Pollution Prevention Act of 1990 (PPA) (42 U.S.C. 13106). The Contractor shall file, for each facility subject to the Form R filing and reporting requirements, the annual Form R throughout the life of the contract.

(b) A Contractor owned or operated facility use in the performance of this contract is exempt from the requirement to file an annual Form R if--

(1) The facility does not manufacture, process or otherwise use any toxic chemicals listed under section 313(c) of EPCRA, 42 U.S.C. 11023(c);

(2) The facility does not have 10 or more full-time employees as specified in section 313(b)(1)(A) of EPCRA, 42 U.S.C. 11023(b)(1)(A);

(3) The facility does not meet the reporting thresholds of toxic chemicals established under section 313(f) of EPCRA, 42 U.S.C. 11023(f) (including the alternate thresholds at 40 CFR 372.27, provided an appropriate certification form has been filed with EPA);

(4) The facility does not fall within Standard Industrial Classification Code (SIC) major groups 20 through 39 or their corresponding North American Industry Classification System (NAICS) sectors 31 through 33; or

(5) The facility is not located within any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, or any other territory or possession over which the United States has jurisdiction.

(c) If the Contractor has certified to an exemption in accordance with one or more of the criteria in paragraph (b) of this clause, and after award of the contract circumstances change so that any one of its owned or operated facilities used in the performance of this contract is no longer exempt-

(1) The Contractor shall notify the Contracting Officer;

and

(2) The Contractor, as owner or operator of a facility used in the performance of this contract is no longer exempt, shall (i) submit a Toxic Chemical Release Inventory Form (Form R) on or before July 1 for the prior calendar year during which the facility becomes eligible; and (ii) continue to file the annual Form R for the life of the contract for such facility.

(d) The Contracting Officer may terminate this contract or take other action as appropriate, if the Contractor fails to comply accurately and fully with the EPCRA and PPA toxic chemical release filing and reporting requirements.

(e) Except for acquisitions of commercial items, as defined in FAR Part 2, the Contractor shall-

(1) For competitive subcontracts expected to exceed \$100,000 (including all options), include a solicitation provision substantially the same as the provision at FAR 52.223-13, Certification of Toxic Chemical Release Reporting; and

(2) Include in any resultant subcontract exceeding \$100,000 (including all options), the substance of this clause, except this paragraph (e).

54. RESERVED

55. DFARS 252.223-7006 PROHIBITION ON STORAGE AND DISPOSAL OF TOXIC AND HAZARDOUS MATERIALS (APR 1993)

(a) Definitions. As used in this clause--

(1) "Storage" means a non-transitory, semi-permanent or permanent holding, placement, or leaving of material. It does not include a temporary accumulation of a limited quantity of a material used in or a waste generated or resulting from authorized activities, such as servicing, maintenance, or repair of Department of Defense (DoD) items, equipment, or facilities.

(2) "Toxic or hazardous materials" means:

(i) Materials referred to in section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (42 U.S.C. 9601(14)) and materials designated under section 102 of CERCLA (42 U.S.C. 9602) (40 CFR Part 302);

(ii) Materials that are of an explosive, flammable, or pyrotechnic nature; or

(iii) Materials otherwise identified by the Secretary of Defense as specified in DoD regulations.

(b) In accordance with 10 U.S.C. 2692, the Contractor is prohibited from storing or disposing of non-DoD-owned toxic or hazardous materials on a DoD installation, except to the extent authorized by a statutory exception to 10 U.S.C. 2692 or as authorized by the Secretary of Defense or his designee.

56. *FAR 52.225-9 BUY AMERICAN ACT—BALANCE OF PAYMENT PROGRAM—CONSTRUCTION MATERIALS (FEB 2000) (For Contracts less than \$6.806 million)

(a) Definitions. As used in this clause—

“Component” means any article, material, or supply incorporated directly into construction materials.

“Construction material” means an article, material, or supply brought to the construction site by the

Contractor or a subcontractor for incorporation into the building or work. The term also includes an item brought to the site preassembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

“Cost of components” means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

“Domestic construction material” means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

“Foreign construction material” means a construction material other than a domestic construction material.

“United States” means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Domestic preference.* (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) and the Balance of Payments Program by providing a preference for domestic construction material. The Contractor shall use only domestic construction material in performing this contract, except as provided in paragraphs (b)(2) and (b)(3) of this clause.

(2) This requirement does not apply to the construction material or components listed by the Government as follows:

[Contracting Officer to list applicable excepted materials or indicate “none”]

(3) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(2) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the requirements of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act or Balance of Payments Program.*

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(3) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(3)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is non-compliant with the Buy American Act or Balance of Payments Program.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
<u>Construction Material</u> <u>Description</u>	<u>Unit of</u> <u>Measure</u>	<u>Quantity</u>	<u>Price</u> <u>(Dollars)*</u>
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

57. *FAR 52.225-10 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS (FEB 2000) (Applicable with FAR 52.225-9)

(a) *Definitions.* “Construction material,” “domestic construction material,” and “foreign construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials” (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) *Requests for determinations of inapplicability.* An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers.* (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign

construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers.* (1) When an offer includes foreign construction material not listed by the Government in this solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

(End of provision)

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
<u>Construction Material</u> <u>Description</u>	<u>Unit of</u> <u>Measure</u>	<u>Quantity</u>	<u>Price</u> <u>(Dollars)*</u>
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]

[Include other applicable supporting information.]

[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(End of clause)

**58. *FAR 52.225-11 BUY AMERICAN ACT—BALANCE OF PAYMENTS PROGRAM-
CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000) [For Contracts more
than \$6,806,000] ALTERNATE I (JUNE 2000) [For Contracts between \$6.806 and 7.068419 Million]**

(a) *Definitions.* As used in this clause—

“Component” means any article, material, or supply incorporated directly into construction materials.

“Construction material” means an article, material, or supply brought to the construction site by the Contractor or subcontractor for incorporation into the building or work. The term also includes an item brought to the site pre-assembled from articles, materials, or supplies. However, emergency life safety systems, such as emergency lighting, fire alarm, and audio evacuation systems, that are discrete systems incorporated into a public building or work and that are produced as complete systems, are evaluated as a single and distinct construction material regardless of when or how the individual parts or components of those

systems are delivered to the construction site. Materials purchased directly by the Government are supplies, not construction material.

“Cost of components” means—

(1) For components purchased by the Contractor, the acquisition cost, including transportation costs to the place of incorporation into the end product (whether or not such costs are paid to a domestic firm), and any applicable duty (whether or not a duty-free entry certificate is issued); or

(2) For components manufactured by the Contractor, all costs associated with the manufacture of the component, including transportation costs as described in paragraph (1) of this definition, plus allocable overhead costs, but excluding profit. Cost of components does not include any costs associated with the manufacture of the end product.

“Designated country” means any of the following countries:

Aruba Kiribati
Austria Korea, Republic of
Bangladesh Lesotho
Belgium Liechtenstein
Benin Luxembourg
Bhutan Malawi
Botswana Maldives
Burkina Faso Mali
Burundi Mozambique
Canada Nepal
Cape Verde Netherlands
Central African Niger
Republic
Chad Norway
Comoros Portugal
Denmark Rwanda
Djibouti Sao Tome and Principe
Equatorial Guinea Sierra Leone
Finland Singapore
France Somalia
Gambia Spain
Germany Sweden
Greece Switzerland
Guinea Tanzania U.R.
Guinea-Bissau Togo
Haiti Tuvalu
Hong Kong Uganda
Ireland United Kingdom
Israel Vanuatu
Italy Western Samoa
Japan Yemen

“Designated country construction material” means a construction material that—

(1) Is wholly the growth, product, or manufacture of a designated country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a designated country into a new and different construction material distinct from the materials from which it was transformed.

“Domestic construction material” means—

(1) An unmanufactured construction material mined or produced in the United States; or

(2) A construction material manufactured in the United States, if the cost of its components mined, produced, or manufactured in the United States exceeds 50 percent of the cost of all its components. Components of foreign origin of the same class or kind for which nonavailability determinations have been made are treated as domestic.

“Foreign construction material” means a construction material other than a domestic construction material.

“North American Free Trade Agreement country” means Canada or Mexico.

“North American Free Trade Agreement country construction material” means a construction material that—

(1) Is wholly the growth, product, or manufacture of a North American Free Trade Agreement (NAFTA) country; or

(2) In the case of a construction material that consists in whole or in part of materials from another country, has been substantially transformed in a NAFTA country into a new and different construction material distinct from the materials from which it was transformed.

“United States” means the 50 States and the District of Columbia, U.S. territories and possessions, Puerto Rico, the Northern Mariana Islands, and any other place subject to U.S. jurisdiction, but does not include leased bases.

(b) *Construction materials.* (1) This clause implements the Buy American Act (41 U.S.C. 10a - 10d) and the Balance of Payments Program by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act and the North American Free Trade Agreement (NAFTA) apply to this acquisition. Therefore, the Buy American Act and Balance of Payments Program restrictions are waived for designated country and NAFTA country construction materials.

(2) The Contractor shall use only domestic, designated country, or NAFTA country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

(3) The requirement in paragraph (b)(2) of this clause does not apply to the construction materials or components listed by the Government as follows:

[Contracting Officer to list applicable excepted materials or indicate “none”]

(4) The Contracting Officer may add other foreign construction material to the list in paragraph (b)(3) of this clause if the Government determines that—

(i) The cost of domestic construction material would be unreasonable. The cost of a particular domestic construction material subject to the restrictions of the Buy American Act is unreasonable when the cost of such material exceeds the cost of foreign material by more than 6 percent. For determination of unreasonable cost under the Balance of Payments Program, the Contracting Officer will use a factor of 50 percent;

(ii) The application of the restriction of the Buy American Act or Balance of Payments Program to a particular construction material would be impracticable or inconsistent with the public interest; or

(iii) The construction material is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.

(c) *Request for determination of inapplicability of the Buy American Act or Balance of Payments Program.*

(1)(i) Any Contractor request to use foreign construction material in accordance with paragraph (b)(4) of this clause shall include adequate information for Government evaluation of the request, including—

(A) A description of the foreign and domestic construction materials;

(B) Unit of measure;

(C) Quantity;

(D) Price;

(E) Time of delivery or availability;

(F) Location of the construction project;

(G) Name and address of the proposed supplier; and

(H) A detailed justification of the reason for use of foreign construction materials cited in accordance with paragraph (b)(3) of this clause.

(ii) A request based on unreasonable cost shall include a reasonable survey of the market and a completed price comparison table in the format in paragraph (d) of this clause.

(iii) The price of construction material shall include all delivery costs to the construction site and any applicable duty (whether or not a duty-free certificate may be issued).

(iv) Any Contractor request for a determination submitted after contract award shall explain why the Contractor could not reasonably foresee the need for such determination and could not have

requested the determination before contract award. If the Contractor does not submit a satisfactory explanation, the Contracting Officer need not make a determination.

(2) If the Government determines after contract award that an exception to the Buy American Act or Balance of Payments Program applies and the Contracting Officer and the Contractor negotiate adequate consideration, the Contracting Officer will modify the contract to allow use of the foreign construction material. However, when the basis for the exception is the unreasonable price of a domestic construction material, adequate consideration is not less than the differential established in paragraph (b)(4)(i) of this clause.

(3) Unless the Government determines that an exception to the Buy American Act or Balance of Payments Program applies, use of foreign construction material is noncompliant with the Buy American Act or Balance of Payments Program.

(d) *Data.* To permit evaluation of requests under paragraph (c) of this clause based on unreasonable cost, the Contractor shall include the following information and any applicable supporting data based on the survey of suppliers:

FOREIGN AND DOMESTIC CONSTRUCTION MATERIALS PRICE COMPARISON			
Construction Material Description	Unit of Measure	Quantity	Price (Dollars)*
<i>Item 1:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____
<i>Item 2:</i>			
Foreign construction material	_____	_____	_____
Domestic construction material	_____	_____	_____

[List name, address, telephone number, and contact for suppliers surveyed. Attach copy of response; if oral, attach summary.]

[Include other applicable supporting information.]

[Include all delivery costs to the construction site and any applicable duty (whether or not a duty-free entry certificate is issued).]*

(End of clause)

Alternate I (June 2000). As prescribed in 25.1102(c)(3), delete the definitions of “North American Free Trade Agreement country” and “North American Free Trade Agreement country construction material” from the definitions in paragraph (a) of the basic clause and substitute the following paragraphs (b)(1) and (b)(2) for paragraphs (b)(1) and (b)(2) of the basic clause:

(b) *Construction materials.* (1) This clause implements the Buy American Act (41 U.S.C. 10a-10d) and the Balance of Payments Program by providing a preference for domestic construction material. In addition, the Contracting Officer has determined that the Trade Agreements Act applies to this acquisition. Therefore, the Buy American Act and Balance of Payments Program restrictions are waived for designated country construction materials.

(2) The Contractor shall use only domestic or designated country construction material in performing this contract, except as provided in paragraphs (b)(3) and (b)(4) of this clause.

59. *FAR 52.225-12 NOTICE OF BUY AMERICAN ACT/BALANCE OF PAYMENTS PROGRAM REQUIREMENT—CONSTRUCTION MATERIALS UNDER TRADE AGREEMENTS (FEB 2000) [Applicable with FAR 52.225-11]] Alternate II (June 2000) [For Contracts Between 6.806 and 7.068419 Million]

(a) *Definitions.* “Construction material,” “designated country construction material,” “domestic construction material,” “foreign construction material,” and “NAFTA country construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(b) *Requests for determination of inapplicability.* An offeror requesting a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of FAR clause 52.225-11 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act or Balance of Payments Program before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) *Evaluation of offers.* (1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act or Balance of Payments Program, based on claimed unreasonable cost of domestic construction materials, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(4)(i) of FAR clause 52.225-11.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) *Alternate offers.* (1) When an offer includes foreign construction material, other than designated country or NAFTA country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic, designated country, or NAFTA country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic, designated country, or NAFTA country construction material, and the offeror shall be required to furnish such domestic, designated country, or NAFTA country construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

(End of provision)

Alternate II (June 2000) [For Contracts between 6.806 and 7.068419 Million]

As prescribed in 25.1102(d)(3), substitute the following paragraphs (a) and (d) for paragraphs (a) and (d) of the basic provision:

(a) *Definitions.* “Construction material,” “designated country construction material,” “domestic construction material,” and “foreign construction material,” as used in this provision, are defined in the clause of this solicitation entitled “Buy American Act—Balance of Payments Program—Construction Materials under Trade Agreements” (Federal Acquisition Regulation (FAR) clause 52.225-11).

(d) *Alternate offers.* (1) When an offer includes foreign construction material, other than designated country construction material, that is not listed by the Government in this solicitation in paragraph (b)(3) of FAR clause 52.225-11, the offeror also may submit an alternate offer based on use of equivalent domestic or designated country construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of FAR clause 52.225-11 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of FAR clause 52.225-11 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic or designated country construction material, and the offeror shall be required to furnish such domestic or designated country construction material. An offer based on use of the foreign construction material for which an exception was requested—

- (i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or
- (ii) May be accepted if revised during negotiations.

60. *FAR 52.225-13 RESTRICTIONS ON CERTAIN FOREIGN PURCHASES (JULY 2000)

(a) The Contractor shall not acquire, for use in the performance of this contract, any supplies or services originating from sources within, or that were located in or transported from or through, countries whose products are banned from importation into the United States under regulations of the Office of Foreign Assets Control, Department of the Treasury. Those countries are Cuba, Iran, Iraq, Libya, North Korea, Sudan, the territory of Afghanistan controlled by the Taliban, and Serbia (excluding the territory of Kosovo).

(b) The Contractor shall not acquire for use in the performance of this contract any supplies or services from entities controlled by the government of Iraq.

(c) The Contractor shall insert this clause, including this paragraph (c), in all subcontracts.
(End of clause)

61. *FAR 52.226-1 UTILIZATION OF INDIAN ORGANIZATIONS AND INDIAN-OWNED ECONOMIC ENTERPRISES (JUNE 2000)

(a) Definitions. As used in this clause:

“Indian” means any person who is a member of any Indian tribe, band, group, pueblo, or community that is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs (BIA) in accordance with 25 U.S.C. 1452(c) and any “Native” as defined in the Alaska Native Claims Settlement Act (43 U.S.C. 1601).

“Indian organization” means the governing body of any Indian tribe or entity established or recognized by the governing body of an Indian tribe for the purposes of 25 U.S.C., chapter 17.

“Indian-owned economic enterprise” means any Indian-owned (as determined by the Secretary of the Interior) commercial, industrial, or business activity established or organized for the purpose of profit, provided that Indian ownership constitutes not less than 51 percent of the enterprise.

“Indian tribe” means any Indian tribe, band, group, pueblo, or community, including native villages and native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, that is recognized by the Federal Government as eligible for services from BIA in accordance with 25 U.S.C. 1452(c).

“Interested party” means a prime contractor or an actual or prospective offeror whose direct economic interest would be affected by the award of a subcontract or by the failure to award a subcontract.

(b) The Contractor shall use its best efforts to give Indian organizations and Indian-owned economic enterprises (25 U.S.C. 1544) the maximum practicable opportunity to participate in the subcontracts it awards to the fullest extent consistent with efficient performance of its contract.

(1) The Contracting Officer and the Contractor, acting in good faith, may rely on the representation of an Indian organization or Indian-owned economic enterprise as to its eligibility, unless an interested party challenges its status or the Contracting Officer has independent reason to question that status. In the event of a challenge to the representation of a subcontractor, the Contracting Officer will refer the matter to the—

U.S. Department of the Interior
Bureau of Indian Affairs (BIA)
Attn: Chief, Division of Contracting and
Grants Administration
1849 C Street, NW,
MS-2626-MIB
Washington, DC 20240-4000.

The BIA will determine the eligibility and notify the Contracting Officer. No incentive payment will be made within 50 working days of subcontract award or while a challenge is pending. If a subcontractor is determined to be an ineligible participant, no incentive payment will be made under the Indian Incentive Program.

(2) The Contractor may request an adjustment under the Indian Incentive Program to the following:

- (i) The estimated cost of a cost-type contract.
- (ii) The target cost of a cost-plus-incentive-fee prime contract.
- (iii) The target cost and ceiling price of a fixed-price incentive prime contract.
- (iv) The price of a firm-fixed-price prime contract.

(3) The amount of the adjustment to the prime contract is 5 percent of the estimated cost, target cost, or firm-fixed-price included in the subcontract initially awarded to the Indian organization or Indian-owned economic enterprise.

(4) The Contractor has the burden of proving the amount claimed and must assert its request for an adjustment prior to completion of contract performance.

(c) The Contracting Officer, subject to the terms and conditions of the contract and the availability of funds, will authorize an incentive payment of 5 percent of the amount paid to the subcontractor. The Contracting Officer will seek funding in accordance with agency procedures.

(End of Clause)

62. *FAR 52.227-1 AUTHORIZATION AND CONSENT (JUL 1995)

(a) The Government authorizes and consents to all use and manufacture, in performing this contract or any subcontract at any tier, of any invention described in and covered by a United States patent

(1) embodied in the structure or composition of any article the delivery of which is accepted by the Government under this contract or

(2) used in machinery, tools, or methods whose use necessarily results from compliance by the Contractor or a subcontractor with

(i) specifications or written provisions forming a part of this contract or

(ii) specific written instructions given by the Contracting Officer directing the manner of performance. The entire liability to the Government for infringement of a patent of the United States shall be determined solely by the provisions of the indemnity clause, if any, included in this contract or any subcontract hereunder (including any lower-tier subcontract), and the Government assumes liability for all other infringement to the extent of the authorization and consent hereinabove granted.

(b) The Contractor agrees to include, and require inclusion of, this clause, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed the simplified acquisition threshold) however, omission of this clause from any subcontract, including those at or below the simplified acquisition threshold, does not affect this authorization and consent.

63. *FAR 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT (AUG 1996)

(a) The Contractor shall report to the Contracting Officer, promptly and in reasonable written detail, each notice or claim of patent or copy-right infringement based on the performance of this contract of which the Contractor has knowledge.

(b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this contract or out of the use of any supplies furnished or work or services performed under this contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.

(c) The Contractor agrees to include, and require inclusion of, this clause in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed the simplified acquisition threshold at FAR 2.101.

64. *FAR 52.227-4 PATENT INDEMNITY--CONSTRUCTION CONTRACTS (APR 1984)

Except as otherwise provided, the Contractor agrees to indemnify the Government and its officers, agents, and employees against liability, including costs and expenses, for infringement upon any United States patent (except a patent issued upon an application that is now or may hereafter be withheld from issue pursuant to a Secrecy Order under 35 U.S.C. 181) arising out of performing this contract or out of the use or disposal by or for the account of the Government of supplies furnished or work performed under this contract.

65. DFARS 252.227-7033 RIGHTS IN SHOP DRAWINGS (APR 1966)

(a) Shop drawings for construction means drawings, submitted to the Government by the Construction Contractor, subcontractor or any lower-tier subcontractor pursuant to a construction contract, showing in detail

(i) the proposed fabrication and assembly of structural elements and (ii) the installation (i.e., form, fit, and attachment details) of materials or equipment. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(b) This clause, including this paragraph (b), shall be included in all subcontracts hereunder at any tier.

66. FAR 52.228-1 BID GUARANTEE (SEP 1996) [NOTE: Not required for projects less than \$100,000]

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of bids.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids; and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.

(c) The amount of the bid guarantee shall be twenty (20%) of the bid price or Three Million Dollars (\$3,000,000), whichever is less.

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid and the bid guarantee is available to offset the difference.

67. *FAR 52.228-2 ADDITIONAL BOND SECURITY (OCT 1997)

The Contractor shall promptly furnish additional security required to protect the Government and persons supplying labor or materials under this contract if--

(a) Any surety upon any bond, or issuing financial institution for other security, furnished with this contract becomes unacceptable to the Government;

(b) Any surety fails to furnish reports on its financial condition as required by the Government;

(c) The contract price is increased so that the penal sum of any bond becomes inadequate in the opinion of the Contracting Officer; or

(d) An irrevocable letter of credit (ILC) used as security will expire before the end of the period of required security. If the Contractor does not furnish an acceptable extension or replacement ILC, or other acceptable substitute, at least 30 days before an ILC's scheduled expiration, the Contracting Officer has the right to immediately draw on the ILC.

68. *FAR 52.228-5 INSURANCE--WORK ON A GOVERNMENT INSTALLATION (JAN 1997) [For Contracts Exceeding \$100,000]

(a) The Contractor shall, at its own expense, provide and maintain during the entire performance of this contract, at least the kinds and minimum amounts of insurance required in the Schedule or elsewhere in the contract.

(b) Before commencing work under this contract, the Contractor shall notify the Contracting Officer in writing that the required insurance has been obtained. The policies evidencing required insurance shall contain an endorsement to the effect that any cancellation or any material change adversely affecting the Government's interest shall not be effective

(1) for such period as the laws of the State in which this contract is to be performed prescribe, or

(2) until 30 days after the insurer or the Contractor gives written notice to the Contracting Officer, whichever period is longer.

(c) The Contractor shall insert the substance of this clause, including this paragraph (c), in subcontracts under this contract that require work on a Government installation and shall require subcontractors to provide and maintain the insurance required in the Schedule or elsewhere in the contract. The Contractor shall maintain a copy of all subcontractors' proofs of required insurance, and shall make copies available to the Contracting Officer upon request.

69. *FAR 52.228-11 PLEDGES OF ASSETS (FEB 1992)

(a) Offerors shall obtain from each person acting as an individual surety on a bid guarantee, a performance bond, or a payment bond--

(1) Pledge of assets; and

(2) Standard Form 28, Affidavit of Individual Surety.

(b) Pledges of assets from each person acting as an individual surety shall be in the form of--

(1) Evidence of an escrow account containing cash, certificates of deposit, commercial or Government securities, or other assets described in FAR 28.203-2 (except see 28.203-2(b)(2) with respect to Government securities held in book entry form) and/or;

(2) A recorded lien on real estate. The offeror will be required to provide--

(i) Evidence of title in the form of a certificate of title prepared by a title insurance company approved by the United States Department of Justice. This title evidence must show fee simple title vested in the surety along with any concurrent owners; whether any real estate taxes are due and payable; and any recorded encumbrances against the property, including the lien filed in favor of the Government as required by FAR 28.203-3(d);

(ii) Evidence of the amount due under any encumbrance shown in the evidence of title;

(iii) A copy of the current real estate tax assessment of the property or a current appraisal dated no earlier than 6 months prior to the date of the bond, prepared by a professional appraiser who certifies that the appraisal has been conducted in accordance with the generally accepted appraisal standards as reflected in the Uniform Standards of Professional Appraisal Practice, as promulgated by the Appraisal Foundation.

70. *FAR 52.228-12 PROSPECTIVE SUBCONTRACTOR REQUESTS FOR BONDS (OCT 1995)

In accordance with Section 806(a)(3) of Public Law 102-190, as amended by Sections 2091 and 8105 of Pub. L. 103-355, upon the request of a prospective subcontractor or supplier offering to furnish labor or material for the performance of this contract for which a payment bond has been furnished to the Government pursuant to the Miller Act, the Contractor shall promptly provide a copy of such payment bond to the requestor.

71. FAR 52.228-13 ALTERNATIVE PAYMENT PROTECTIONS (JULY 2000) [Applicable only for projects or delivery orders less than \$100,000]

(a) The Contractor shall submit one of the following payment protections:

(1) A payment bond.

(2) An irrevocable letter of credit from a federally insured financial institution.

(b) The amount of the payment protection shall be 100 percent of the contract price.

(c) The submission of the payment protection is required within 10 days of contract award.

(d) The payment protection shall provide protection for the full contract performance period plus a one-year period.

(e) Except for escrow agreements and payment bonds, which provide their own protection procedures, the Contracting Officer is authorized to access funds under the payment protection when it has been alleged in writing by a supplier of labor or material that a nonpayment has occurred, and to withhold funds pending resolution by administrative or judicial proceedings or mutual agreement of the parties.

(f) When a tripartite escrow agreement is used, the Contractor shall utilize only suppliers of labor and material that signed the escrow agreement.

72. FAR 52.228-14 IRREVOCABLE LETTER OF CREDIT (DEC 1999)

(a) "Irrevocable letter of credit" (ILC), as used in this clause, means a written commitment by a federally insured financial institution to pay all or part of a stated amount of money, until the expiration date of the letter, upon presentation by the Government (the beneficiary) of a written demand therefor. Neither the financial institution nor the offeror/Contractor can revoke or condition the letter of credit.

(b) If the offeror intends to use an ILC in lieu of a bid bond, or to secure other types of bonds such as performance and payment bonds, the letter of credit and letter of confirmation formats in paragraphs (e) and (f) of this clause shall be used.

(c) The letter of credit shall be irrevocable, shall require presentation of no document other than a written demand and the ILC (including confirming letter, if any), shall be issued/confirmed by an acceptable federally insured financial institution as provided in paragraph (d) of this clause, and--

(1) If used as a bid guarantee, the ILC shall expire no earlier than 60 days after the close of the bid acceptance period;

(2) If used as an alternative to corporate or individual sureties as security for a performance or payment bond, the offeror/Contractor may submit an ILC to cover the entire period of performance or may submit an ILC with an initial expiration date estimated to cover the entire period for which financial security is required or may submit an ILC with an initial expiration that is a minimum period of one year from the date of issuance. The ILC shall provide that, unless the issuer provides the beneficiary written notice of non-renewal of least 60 days in advance of the current expiration date, the ILC is automatically extended without amendment for one year from the expiration date, or any future expiration date, until the period of required coverage is completed and the Contracting Officer provides the financial institution with a written statement waiving the right to payment. The period of required coverage shall be:

(i) For contracts subject to the Miller Act, the later of--

(A) One year following the expected date of final payment;

(B) For performance bonds only, until completion of any warranty period; or

(C) For payment bonds only, until resolution of all claims filed against the payment bond during the one-year period following final payment.

(ii) For contracts not subject to the Miller Act, the later of--

(A) 90 days following final payment; or

(B) For performance bonds only, until completion of any warranty period.

(d) Only federally insured financial institution rated investment grade or higher shall issue or confirm the ILC. The offeror/Contractor shall provide the Contracting Officer a credit rating that indicates the financial institution has the required rating(s) as of the date of issuance of the ILC. Unless the financial institution issuing the ILC had letter of credit business of at least \$25 million in the past year, ILCs over \$5 million must be confirmed by another acceptable financial institution that had letter of credit business of at least \$25 million in the past year.

(e) The following format shall be used by the issuing financial institution to create an ILC:

[Issuing Financial Institution's Letterhead or Name and Address]

Issue Date-----

Irrevocable Letter of Credit No.-----

Account party's name-----

Account party's address-----

For Solicitation No.-----

(For reference only)

TO: [U.S. Government agency]

[U.S. Government agency's address]

1. We hereby establish this irrevocable and transferable Letter of Credit in your favor for one or more drawings up to United States \$_____. This Letter of Credit is payable at [issuing financial institution's and, if any, confirming financial institution's] office at [issuing financial institution's address and, if any, confirming financial institution's address] and expires with our close of business on _____, or any automatically extended expiration date.

2. We hereby undertake to honor your or transferee's sight draft(s) drawn on issuing or, if any, the confirming financial institution, for all or any part of this credit if presented with this Letter of Credit and confirmation, if any, at the office specified in paragraph 1 of this Letter of Credit on or before the expiration date or any automatically extended expiration date.

3. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this Letter of Credit that it is deemed to be automatically extended without amendment for one year from the expiration date hereof, or any future expiration date, unless at least 60 days prior to any expiration date, we notify you or the transferee by registered mail, or other receipted means of delivery, that we elect not to consider this

Letter of Credit renewed for any such additional period. At the time we notify you, we also agree to notify the account party (and confirming financial institution, if any) by the same means of delivery.

4. This Letter of Credit is transferable. Transfers and assignments of proceeds are to be effected without charge to either the beneficiary or the transferee/assignee of proceeds. Such transfer or assignment shall be only at the written direction of the Government (the beneficiary) in a form satisfactory to the issuing financial institution and the confirming financial institution, if any.

5. This Letter of Credit is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution, if any, otherwise state of issuing financial institution].

6. If this credit expires during an interruption of business of this financial institution as described in Article 17 of the UCP, the financial institution specifically agrees to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Issuing financial institution]

(f) The following format shall be used by the financial institution to confirm an ILC:

[Confirming Financial Institution's Letterhead or Name and Address]---

(Date) _____

Our Letter of Credit

Advice Number-----

Beneficiary:-----

[U.S. Government agency]

Issuing Financial Institution:-----

Issuing Financial Institution's LC No.:-----

Gentlemen:

1. We hereby confirm the above indicated Letter of Credit, the original of which is attached, issued by _____ [name of issuing financial institution] for drawings of up to United States dollars _____/U.S. \$_____ and expiring with our close of business on _____ [the expiration date], or any automatically extended expiration date.

2. Draft(s) drawn under the Letter of Credit and this Confirmation are payable at our office located at _____.

3. We hereby undertake to honor sight draft(s) drawn under and presented with the Letter of Credit and this Confirmation at our offices as specified herein.

4. [This paragraph is omitted if used as a bid guarantee, and subsequent paragraphs are renumbered.] It is a condition of this confirmation that it be deemed automatically extended without amendment for one year from the expiration date hereof, or any automatically extended expiration date, unless:

(a) At least 60 days prior to any such expiration date, we shall notify the Contracting Officer, or the transferee and the issuing financial institution, by registered mail or other receipted means of delivery, that we elect not to consider this confirmation extended for any such additional period; or

(b) The issuing financial institution shall have exercised its right to notify you or the transferee, the account party, and ourselves, of its election not to extend the expiration date of the Letter of Credit.

5. This confirmation is subject to the Uniform Customs and Practice (UCP) for Documentary Credits, 1993 Revision, International Chamber of Commerce Publication No. 500, and to the extent not inconsistent therewith, to the laws of _____ [state of confirming financial institution].

6. If this confirmation expires during an interruption of business of this financial institution as described in Article 17 of the UCP, we specifically agree to effect payment if this credit is drawn against within 30 days after the resumption of our business.

Sincerely,

[Confirming financial institution]

(g) The following format shall be used by the Contracting Officer for a sight draft to draw on the Letter of Credit:
SIGHT DRAFT

[City, State]

(Date) _____

[Name and address of financial institution]

Pay to the order of-----

[Beneficiary Agency] _____

the sum of United States \$ _____

This draft is drawn under-----

Irrevocable Letter of Credit No.-----

[Beneficiary Agency]

By: _____

73. FAR 52.228-15 PERFORMANCE AND PAYMENT BONDS (JULY 2000).

[This provision is Not Required for projects less than \$100,000. See Clauses "Alternate Payment Protections" and "Inapplicable Provisions and Clauses".]

(a) *Definitions.* As used in this clause—

“Original contract price” means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) *Amount of required bonds.* Unless the resulting contract price is \$100,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) *Performance bonds (Standard Form 25).* The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) *Payment Bonds (Standard Form 25-A).* The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) *Additional bond protection.* (i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) *Furnishing executed bonds.* The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) *Surety or other security for bonds.* The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the Federal Register or may be obtained from the:

U.S. Department of Treasury
Financial Management Service
Surety Bond Branch
401 14th Street, NW, 2nd Floor, West Wing
Washington, DC 20227.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 270b(c)).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.
(End of clause)

74. FAR 52.229-3 FEDERAL, STATE, AND LOCAL TAXES (JAN 1991) [For Contracts Exceeding \$100,000]

(a) "Contract date," as used in this clause, means the date set for bid opening or, if this is a negotiated contract or a modification, the effective date of this contract or modification.

"All applicable Federal, State, and local taxes and duties," as used in this clause, means all taxes and duties, in effect on the contract date, that the taxing authority is imposing and collecting on the transactions or property covered by this contract.

"After-imposed Federal tax," as used in this clause, means any new or increased Federal excise tax or duty, or tax that was exempted or excluded on the contract date but whose exemption was later revoked or reduced during the contract period, on the transactions or property covered by this contract that the Contractor is required to pay or bear as the result of legislative, judicial, or administrative action taking effect after the contract date. It does not include social security tax or other employment taxes.

"After-relieved Federal tax," as used in this clause, means any amount of Federal excise tax or duty, except social security or other employment taxes, that would otherwise have been payable on the transactions or property covered by this contract, but which the Contractor is not required to pay or bear, or for which the Contractor obtains a refund or drawback, as the result of legislative, judicial, or administrative action taking effect after the contract date.

(b) The contract price includes all applicable Federal, State, and local taxes and duties.

(c) The contract price shall be increased by the amount of any after-imposed Federal tax, provided the Contractor warrants in writing that no amount for such newly imposed Federal excise tax or duty or rate increase was included in the contract price, as a contingency reserve or otherwise.

(d) The contract price shall be decreased by the amount of any after-relieved Federal tax.

(e) The contract price shall be decreased by the amount of any Federal excise tax or duty, except social security or other employment taxes, that the Contractor is required to pay or bear, or does not obtain a refund of, through the Contractor's fault, negligence, or failure to follow instructions of the Contracting Officer.

(f) No adjustment shall be made in the contract price under this clause unless the amount of the adjustment exceeds \$250.

(g) The Contractor shall promptly notify the Contracting Officer of all matters relating to any Federal excise tax or duty that reasonably may be expected to result in either an increase or decrease in the contract price and shall take appropriate action as the Contracting Officer directs.

(h) The Government shall, without liability, furnish evidence appropriate to establish exemption from any Federal, State, or local tax when the Contractor requests such evidence and a reasonable basis exists to sustain the exemption.

75. *FAR 52.229-5 TAXES--CONTRACTS PERFORMED IN U.S. POSSESSIONS OR PUERTO RICO (APR 1984)

The term "local taxes," as used in the Federal, State, and local taxes clause of this contract, includes taxes imposed by a possession of the United States or by Puerto Rico.

76. DFARS 252.231-7000

SUPPLEMENTAL COST PRINCIPLES (DEC 1991)

When the allowability of costs under this contract is determined in accordance with part 31 of the Federal Acquisition Regulation (FAR) allowability shall also be determined in accordance with part 231 of the DoD FAR Supplement, in effect on the date of this contract.

77. *FAR 52.232-5
1997)

PAYMENTS UNDER FIXED-PRICE CONSTRUCTION CONTRACTS (MAY

(a) Payment of Price. The Government shall pay the Contractor the contract price as provided in this contract.

(b) Progress Payments. The Government shall make progress payments monthly as the work proceeds, or at more frequent intervals as determined by the Contracting Officer, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer.

(1) The Contractor's request for progress payments shall include the following substantiation:

(i) An itemization of the amounts requested, related to the various elements of work required by the contract covered by the payment requested.

(ii) A listing of the amount included for work performed by each subcontractor under the contract.

(iii) A listing of the total amount of each subcontract under the contract.

(iv) A listing of the amounts previously paid to each such subcontractor under the contract.

(v) Additional supporting data in a form and detail required by the Contracting Officer.

(2) In the preparation of estimates, the Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration. Material delivered to the Contractor at locations other than the site also may be taken into consideration if--

(i) Consideration is specifically authorized by this contract; and

(ii) The Contractor furnishes satisfactory evidence that it has acquired title to such material and that the material will be used to perform this contract.

(c) Contractor Certification. Along with each request for progress payments, the Contractor shall furnish the following certification, or payment shall not be made: (However, if the Contractor elects to delete paragraph (c)(4) from the certification, the certification is still acceptable.) I hereby certify, to the best of my knowledge and belief, that--

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements and the requirements of chapter 39 of Title 31, United States Code;

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of the subcontract; and

(4) This certification is not to be construed as final acceptance of a subcontractor's performance.

(Name)

(Title)

(Date)

(d) Refund of Unearned Amounts. If the Contractor, after making a certified request for progress payments, discovers that a portion or all of such request constitutes a payment for performance by the Contractor that fails to conform to the specifications, terms, and conditions of this contract (hereinafter referred to as the "unearned amount"), the Contractor shall--

(1) Notify the Contracting Officer of such performance deficiency; and
(2) Be obligated to pay the Government an amount (computed by the Contracting Officer in the manner provided in paragraph (j) of this clause) equal to interest on the unearned amount from the 8th day after the date of receipt of the unearned amount until--

(i) The date the Contractor notifies the Contracting Officer that the performance deficiency has been corrected; or
(ii) The date the Contractor reduces the amount of any subsequent certified request for progress payments by an amount equal to the unearned amount.

(e) Retainage. If the Contracting Officer finds that satisfactory progress was achieved during any period for which a progress payment is to be made, the Contracting Officer shall authorize payment to be made in full. However, if satisfactory progress has not been made, the Contracting Officer may retain a maximum of 10 percent of the amount of the payment until satisfactory progress is achieved. When the work is substantially complete, the Contracting Officer may retain from previously withheld funds and future progress payments that amount the Contracting Officer considers adequate for protection of the Government and shall release to the Contractor all the remaining withheld funds. Also, on completion and acceptance of each separate building, public work, or other division of the contract, for which the price is stated separately in the contract, payment shall be made for the completed work without retention of a percentage.

(f) Title, Liability, and Reservation of Rights. All material and work covered by progress payments made shall, at the time of payment, become the sole property of the Government, but this shall not be construed as--

(1) Relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or
(2) Waiving the right of the Government to require the fulfillment of all of the terms of the contract.

(g) Reimbursement for Bond Premiums. In making these progress payments, the Government shall, upon request, reimburse the Contractor for the amount of premiums paid for performance and payment bonds (including coinsurance and reinsurance agreements, when applicable) after the Contractor has furnished evidence of full payment to the surety. The retainage provisions in paragraph (e) of this clause shall not apply to that portion of progress payments attributable to bond premiums.

(h) Final Payment. The Government shall pay the amount due the Contractor under this contract after--
(1) Completion and acceptance of all work;
(2) Presentation of a properly executed voucher; and
(3) Presentation of release of all claims against the Government arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned under the Assignment of Claims Act of 1940 (31 U.S.C. 3727 and 41 U.S.C. 15).

(i) Limitation Because of Unfinalized Work. Notwithstanding any provision of this contract, progress payments shall not exceed 80 percent on work accomplished on unfinalized contract actions. A "contract action" is any action resulting in a contract, as defined in FAR Subpart 2.1, including contract modifications for additional supplies or services, but not including contract modifications that are within the scope and under the terms of the contract, such as contract modifications issued pursuant to the Changes clause, or funding and other administrative changes.

(j) Interest Computation on Unearned Amounts. In accordance with 31 U.S.C. 3903(c)(1), the amount payable under subparagraph (d)(2) of this clause shall be--

(1) Computed at the rate of average bond equivalent rates of 91-day Treasury bills auctioned at the most recent auction of such bills prior to the date the Contractor receives the unearned amount; and
(2) Deducted from the next available payment to the Contractor.

78. RESERVED.

79. *FAR 52.232-17 INTEREST (JUN 1996)

(a) Except as otherwise provided in this contract under a Price Reduction for Defective Cost or Pricing Data clause or a Cost Accounting Standards clause, all amounts that become payable by the Contractor to the Government under this contract (net of any applicable tax credit under the Internal Revenue Code (26 U.S.C. 1481)) shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in Section 12 of the Contract Disputes Act of 1978 (Public Law 95-563), which is applicable to the period in which the amount becomes due, as provided in paragraph (b) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(b) Amounts shall be due at the earliest of the following dates:

(1) The date fixed under this contract.

(2) The date of the first written demand for payment consistent with this contract, including any demand resulting from a default termination.

(3) The date the Government transmits to the Contractor a proposed supplemental agreement to confirm completed negotiations establishing the amount of debt.

(4) If this contract provides for revision of prices, the date of written notice to the Contractor stating the amount of refund payable in connection with a pricing proposal or a negotiated pricing agreement not confirmed by contract modification.

(c) The interest charge made under this clause may be reduced under the procedures prescribed in 32.614-2 of the Federal Acquisition Regulation in effect on the date of this contract.

80. *FAR 52.232-23 ASSIGNMENT OF CLAIMS (JAN 1986)

(a) The Contractor, under the Assignment of Claims Act, as amended, 31 U.S.C. 3727, 41 U.S.C. 15 (hereafter referred to as "the Act"), may assign its rights to be paid amounts due or to become due as a result of the performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.

(b) Any assignment or reassignment authorized under the Act and this clause shall cover all unpaid amounts payable under this contract, and shall not be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this contract.

(c) The Contractor shall not furnish or disclose to any assignee under this contract any classified document (including this contract) or information related to work under this contract until the Contracting Officer authorizes such action in writing.

81. *FAR 52.232-27 PROMPT PAY FOR CONSTRUCTION CONTRACTS (MAY 2001)

Notwithstanding any other payment terms in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in this clause. Payment shall be considered as being made on the day a check is dated or the date of an electronic funds transfer. Definitions of pertinent terms are set forth in sections 2.101 and 32.902 of the Federal Acquisition Regulation. All days referred to in this clause are calendar days, unless otherwise specified. (However, see subparagraph (a)(3) concerning payments due on Saturdays, Sundays, and legal holidays.)

(a) Invoice payments--

(1) Types of invoice payments. For purposes of this clause, there are several types of invoice payments that may occur under this contract, as follows:

(i) Progress payments, if provided for elsewhere in this contract, based on Contracting Officer approval of the estimated amount and value of work or services performed, including payments for reaching milestones in any project:

(A) The due date for making such payments shall be 14 days after receipt of the payment request by the designated billing office. If the designated billing office fails to annotate the payment request with the actual date of receipt at the time of receipt, the payment due date shall be the 14th day after the date of the Contractor's payment request, provided a proper payment request is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) The due date for payment of any amounts retained by the Contracting Officer in accordance with the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts, shall be as specified in the contract or, if not specified, 30 days after approval for release to the Contractor by the Contracting Officer.

(ii) Final payments based on completion and acceptance of all work and presentation of release of all claims against the Government arising by virtue of the contract, and payments for partial deliveries that have been accepted by the Government (e.g., each separate building, public work, or other division of the contract for which the price is stated separately in the contract):

(A) The due date for making such payments shall be either the 30th day after receipt by the designated billing office of a proper invoice from the Contractor, or the 30th day after Government acceptance of the work or services completed by the Contractor, whichever is later. If the designated billing office fails to annotate the invoice with the date of actual receipt at the time of receipt, the invoice payment due date shall be the 30th day after the date of the Contractor's invoice, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(B) On a final invoice where the payment amount is subject to contract settlement actions (e.g., release of claims), acceptance shall be deemed to have occurred on the effective date of the contract settlement.

(2) Contractor's Invoice. The Contractor shall prepare and submit invoices to the designated billing office specified in the contract. A proper invoice must include the items listed in paragraphs (a)(2)(i) through (a)(2)(ix) of this clause. If the invoice does not comply with these requirements, it shall be returned within 7 days after the date the designated billing office received the invoice, with a statement of the reasons why it is not a proper invoice. Untimely notification will be taken into account in computing any interest penalty owed the Contractor in the manner described in subparagraph (a)(4) of this clause.

(i) Name and address of the Contractor.

(ii) Invoice Date. (The Contractor is encouraged to date invoices as close as possible to the date of mailing or transmission.)

(iii) Contract number or other authorization for work or services performed (including order number and contract line item number).

(iv) Description of work or services performed.

(v) Delivery and payment terms (e.g., prompt payment discount terms).

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number, and mailing address of person to be notified in the event of a defective invoice.

(viii) For payments described in paragraph (a)(1)(i) of this clause, substantiation of the amounts requested and certification in accordance with the requirements of the clause at 52.232-5, Payments Under Fixed-Price Construction Contracts.

(ix) Any other information or documentation required by the contract.

(x) While not required, the Contractor is strongly encouraged to assign an identification number to each invoice.

(3) Interest Penalty. An interest penalty shall be paid automatically by the designated payment office, without request from the Contractor, if payment is not made by the due date and the conditions listed in paragraphs (a)(3)(i) through (a)(3)(iii) of this clause are met, if applicable. However, when the due date falls on a Saturday, Sunday, or legal holiday when Federal Government offices are closed and Government business is not

expected to be conducted, payment may be made on the following business day without incurring a late payment interest penalty.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, Contractor compliance with any contract term or condition, or requested progress payment amount.

(iii) In the case of a final invoice for any balance of funds due the Contractor for work or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(4) Computing Penalty Amount. The interest penalty shall be at the rate established by the Secretary of the Treasury under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority (e.g., tariffs). This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice principal payment amount approved by the Government until the payment date of such approved principal amount; and will be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice principal payment amount and will be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the Contractor of a defective invoice within the periods prescribed in subparagraph (a)(2) of this clause, the due date on the corrected invoice will be adjusted by subtracting from such date the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties.

(i) For the sole purpose of computing an interest penalty that might be due the Contractor for payments described in paragraph (a)(1)(ii) of this clause, Government acceptance or approval shall be deemed to have occurred constructively on the 7th day after the Contractor has completed the work or services in accordance with the terms and conditions of the contract. In the event that actual acceptance or approval occurs within the constructive acceptance or approval period, the determination of an interest penalty shall be based on the actual date of acceptance or approval. Constructive acceptance or constructive approval requirements do not apply if there is a disagreement over quantity, quality, or Contractor compliance with a contract provision. These requirements also do not compel Government officials to accept work or services, approve Contractor estimates, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the Contractor of defects in invoices submitted to the Government, but this may not exceed 7 days.

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(C) For incorrect electronic funds transfer (EFT) information, in accordance with the EFT clause of this contract.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and the Contractor over the payment amount or other issues involving contract compliance, or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(5) Prompt Payment Discounts. An interest penalty also shall be paid automatically by the designated payment office, without request from the Contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(6) Additional Interest Penalty.

(i) A penalty amount, calculated in accordance with subdivision (a)(6)(iii) of this clause, shall be paid in addition to the interest penalty amount if the Contractor--

(A) Is owed an interest penalty of \$1 or more;
 (B) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(C) Makes a written demand to the designated payment office for additional penalty payment, in accordance with subdivision (a)(6)(ii) of this clause, postmarked not later than 40 days after the date the invoice amount is paid.

(ii)(A) Contractors shall support written demands for additional penalty payments with the following data. No additional data shall be required. Contractors shall--

- (1) Specifically assert that late payment interest is due under a specific invoice, and request payment of all overdue late payment interest penalty and such additional penalty as may be required;
- (2) Attach a copy of the invoice on which the unpaid late payment interest was due; and
- (3) State that payment of the principal has been received, including the date of receipt.

(B) Demands must be postmarked on or before the 40th day after payment was made, except that--

- (1) If the postmark is illegible or nonexistent, the demand must have been received and annotated with the date of receipt by the designated payment office on or before the 40th day after payment was made; or
- (2) If the postmark is illegible or nonexistent and the designated payment office fails to make the required annotation, the demand's validity will be determined by the date the Contractor has placed on the demand; provided such date is no later than the 40th day after payment was made.

(iii)(A) The additional penalty shall be equal to 100 percent of any original late payment interest penalty except--

- (1) For additional penalties due on or before January 22, 1992, such penalties shall not exceed \$2,500;
- (2) After January 22, 1992, the additional penalty shall not exceed \$5,000;
- (3) The additional penalty shall never be less than \$25; and
- (4) No additional penalty is owed if the amount of the underlying interest penalty is less than \$1.

(B) If the interest penalty ceases to accrue in accordance with the limits stated in subdivision (a)(4)(iii) of this clause, the amount of the additional penalty shall be calculated on the amount of interest penalty that would have accrued in the absence of these limits, subject to the overall limits on the additional penalty specified in subdivision (a)(6)(iii)(A) of this clause.

(C) For determining the maximum and minimum additional penalties, the test shall be the interest penalty due on each separate payment made for each separate contract. The maximum and minimum additional penalty shall not be based upon individual invoices unless the invoices are paid separately. Where payments are consolidated for disbursing purposes, the maximum and minimum additional penalty determination shall be made separately for each contract therein.

(D) The additional penalty does not apply to payments regulated by other Government regulations (e.g., payments under utility contracts subject to tariffs and regulation).

(b) Contract Financing Payments--

- (1) Due dates for recurring financing payments. If this contract provides for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the (insert day as prescribed by Agency head; if not prescribed, insert 30th day) day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.
- (2) Due dates for other contract financing. For advance payments, loans, or other arrangements that do not involve recurring submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.
- (3) Interest Penalty Not Applicable. Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) Subcontract Clause Requirements. The Contractor shall include in each subcontract for property or services (including a material supplier) for the purpose of performing this contract the following:

(1) Prompt Payment for Subcontractors. A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract not later than 7 days from receipt of payment out of such amounts as are paid to the Contractor under this contract.

(2) Interest for Subcontractors. An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty for each payment not made in accordance with the payment clause--

(i) For the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; and

(ii) Computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(3) Subcontractor Clause Flowdown. A clause requiring each subcontractor to include a payment clause and an interest penalty clause conforming to the standards set forth in subparagraphs (c)(1) and (c)(2) of this clause in each of its subcontracts, and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

(d) Subcontract Clause Interpretation. The clauses required by paragraph (c) of this clause shall not be construed to impair the right of the Contractor or a subcontractor at any tier to negotiate, and to include in their subcontract, provisions that--

(1) Retainage Permitted. Permit the Contractor or a subcontractor to retain (without cause) a specified percentage of each progress payment otherwise due to a subcontractor for satisfactory performance under the subcontract without incurring any obligation to pay a late payment interest penalty, in accordance with terms and conditions agreed to by the parties to the subcontract, giving such recognition as the parties deem appropriate to the ability of a subcontractor to furnish a performance bond and a payment bond;

(2) Withholding Permitted. Permit the Contractor or subcontractor to make a determination that part or all of the subcontractor's request for payment may be withheld in accordance with the subcontract agreement; and

(3) Withholding Requirements. Permit such withholding without incurring any obligation to pay a late payment penalty if--

(i) A notice conforming to the standards of paragraph (g) of this clause previously has been furnished to the subcontractor; and

(ii) A copy of any notice issued by a Contractor pursuant to subdivision (d)(3)(i) of this clause has been furnished to the Contracting Officer.

(e) Subcontractor Withholding Procedures. If a Contractor, after making a request for payment to the Government but before making a payment to a subcontractor for the subcontractor's performance covered by the payment request, discovers that all or a portion of the payment otherwise due such subcontractor is subject to withholding from the subcontractor in accordance with the subcontract agreement, then the Contractor shall--

(1) Subcontractor Notice. Furnish to the subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon ascertaining the cause giving rise to a withholding, but prior to the due date for subcontractor payment;

(2) Contracting Officer Notice. Furnish to the Contracting Officer, as soon as practicable, a copy of the notice furnished to the subcontractor pursuant to subparagraph (e)(1) of this clause;

(3) Subcontractor Progress Payment Reduction. Reduce the subcontractor's progress payment by an amount not to exceed the amount specified in the notice of withholding furnished under subparagraph (e)(1) of this clause;

(4) Subsequent Subcontractor Payment. Pay the subcontractor as soon as practicable after the correction of the identified subcontract performance deficiency, and--

(i) Make such payment within--

(A) Seven days after correction of the identified subcontract performance deficiency (unless the funds therefor must be recovered from the Government because of a reduction under paragraph (e)(5)(i) of this clause; or

(B) Seven days after the Contractor recovers such funds from the Government; or

(ii) Incur an obligation to pay a late payment interest penalty computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments

under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty;

(5) Notice to Contracting Officer. Notify the Contracting Officer upon--

- (i) Reduction of the amount of any subsequent certified application for payment; or
- (ii) Payment to the subcontractor of any withheld amounts of a progress payment,

specifying--

(A) The amounts withheld under subparagraph (e)(1) of this clause; and

(B) The dates that such withholding began and ended; and

(6) Interest to Government. Be obligated to pay to the Government an amount equal to interest on the withheld payments (computed in the manner provided in 31 U.S.C. 3903(c)(1)), from the 8th day after receipt of the withheld amounts from the Government until--

- (i) The day the identified subcontractor performance deficiency is corrected; or
- (ii) The date that any subsequent payment is reduced under subdivision (e)(5)(i) of this

clause.

(f) Third-Party Deficiency Reports--(1) Withholding from subcontractor. If a Contractor, after making payment to a first-tier subcontractor, receives from a supplier or subcontractor of the first-tier subcontractor (hereafter referred to as a "second-tier subcontractor") a written notice in accordance with section 2 of the Act of August 24, 1935 (40 U.S.C. 270b, Miller Act), asserting a deficiency in such first-tier subcontractor's performance under the contract for which the Contractor may be ultimately liable, and the Contractor determines that all or a portion of future payments otherwise due such first-tier subcontractor is subject to withholding in accordance with the subcontract agreement, the Contractor may, without incurring an obligation to pay an interest penalty under subparagraph (e)(6) of this clause--

(i) Furnish to the first-tier subcontractor a notice conforming to the standards of paragraph (g) of this clause as soon as practicable upon making such determination; and

(ii) Withhold from the first-tier subcontractor's next available progress payment or payments an amount not to exceed the amount specified in the notice of withholding furnished under paragraph (f)(1)(i) of this clause.

(2) Subsequent Payment or Interest Charge. As soon as practicable, but not later than 7 days after receipt of satisfactory written notification that the identified subcontract performance deficiency has been corrected, the Contractor shall--

(i) Pay the amount withheld under paragraph (f)(1)(ii) of this clause to such first-tier subcontractor; or

(ii) Incur an obligation to pay a late payment interest penalty to such first-tier subcontractor computed at the rate of interest established by the Secretary of the Treasury, and published in the Federal Register, for interest payments under section 12 of the Contracts Disputes Act of 1978 (41 U.S.C. 611) in effect at the time the Contractor accrues the obligation to pay an interest penalty.

(g) Written Notice of Subcontractor Withholding. A written notice of any withholding shall be issued to a subcontractor (with a copy to the Contracting Officer of any such notice issued by the Contractor), specifying--

- (1) The amount to be withheld;
- (2) The specific causes for the withholding under the terms of the subcontract; and
- (3) The remedial actions to be taken by the subcontractor in order to receive payment of the

amounts withheld.

(h) Subcontractor Payment Entitlement. The Contractor may not request payment from the Government of any amount withheld or retained in accordance with paragraph (d) of this clause until such time as the Contractor has determined and certified to the Contracting Officer that the subcontractor is entitled to the payment of such amount.

(i) Prime-Subcontractor Disputes. A dispute between the Contractor and subcontractor relating to the amount or entitlement of a subcontractor to a payment or a late payment interest penalty under a clause included in the subcontract pursuant to paragraph (c) of this clause does not constitute a dispute to which the United States is a party. The United States may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

(j) Preservation of Prime-Subcontractor Rights. Except as provided in paragraph (i) of this clause, this clause shall not limit or impair any contractual, administrative, or judicial remedies otherwise available to the

Contractor or a subcontractor in the event of a dispute involving late payment or nonpayment by the Contractor or deficient subcontract performance or nonperformance by a subcontractor.

(k) Non-Recourse for Prime Contractor Interest Penalty. The Contractor's obligation to pay an interest penalty to a subcontractor pursuant to the clauses included in a subcontract under paragraph (c) of this clause shall not be construed to be an obligation of the United States for such interest penalty. A cost-reimbursement claim may not include any amount for reimbursement of such interest penalty.

82. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) *Method of payment.* (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term “EFT” refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either—

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) *Contractor's EFT information.* The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) *Mechanisms for EFT payment.* The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) *Suspension of payment.* If the Contractor's EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) *Contractor EFT arrangements.* If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) *Liability for uncompleted or erroneous transfers.* (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor's EFT information incorrectly, the Government remains responsible for—

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor's EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and—

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) *EFT and prompt payment.* A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) *EFT and assignment of claims.* If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) *Liability for change of EFT information by financial agent.* The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) *Payment information.* The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.
(End of Clause)

83. DFARS 252.232-7004 DOD PROGRESS PAYMENT RATES (OCT 2001)

(a) If the contractor is a small business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Unfinalized Contract Actions*) to 90 percent.

(b) If the contractor is a small disadvantaged business concern, the Progress Payments clause of this contract is modified to change each mention of the progress payment rate and liquidation rate (excepting paragraph (k), *Limitations on Unfinalized Contract Actions*) to 95 percent.
(End of clause)

84. DFARS 252.232-7005 REIMBURSEMENT OF SUBCONTRACTOR ADVANCE PAYMENTS--DOD PILOT MENTOR-PROTEGE PROGRAM (SEP 2001)

(a) The Government will reimburse the Contractor for any advance payments made by the Contractor, as a mentor firm, to a protege firm, pursuant to an approved mentor-protege agreement, provided--

(1) The Contractor's subcontract with the protege firm includes a provision substantially the same as FAR 52.232-12, Advance Payments;

(2) The Contractor has administered the advance payments in accordance with the policies of FAR Subpart 32.4; and

(3) The Contractor agrees that any financial loss resulting from the failure or inability of the protege firm to repay any unliquidated advance payments is the sole financial responsibility of the Contractor.

(b) For a fixed price type contract, advance payments made to a protege firm shall be paid and administered as if they were 100 percent progress payments. The Contractor shall include as a separate attachment with each Standard Form (SF) 1443, Contractor's Request for Progress Payment, a request for reimbursement of advance payments made to a protege firm. The attachment shall provide a separate calculation of lines 14a through 14e of SF 1443 for each protege, reflecting the status of advance payments made to that protege.

(c) For cost reimbursable contracts, reimbursement of advance payments shall be made via public voucher. The Contractor shall show the amounts of advance payments made to each protege on the public voucher, in the form and detail directed by the cognizant contracting officer or contract auditor.
(End of clause)

85. *FAR 52.233-1 DISPUTES (DEC 1998)

(a) This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613).

(b) Except as provided in the Act, all disputes arising under or relating to this contract shall be resolved under this clause.

(c) 'Claim,' as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to this contract. A claim arising under a contract, unlike a claim relating to that contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. However, a written demand or written assertion by the Contractor seeking the payment of money exceeding \$100,000 is not a claim under the Act until certified as required by subparagraph (d)(2) of this clause. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim under the Act. The submission may be converted to a claim under the Act, by complying with the submission and certification requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(d)(1) A claim by the Contractor shall be made in writing and, unless otherwise stated in this contract, submitted within 6 years after accrual of the claim to the Contracting Officer for a written decision. A claim by the Government against the Contractor shall be subject to a written decision by the Contracting Officer.

(2) (i) Contractors shall provide the certification specified in paragraph (d)(2)(iii) of this clause when submitting any claim exceeding \$100,000.

(ii) The certification requirement does not apply to issues in controversy that have not been submitted as all or part of a claim.

(iii) The certification shall state as follows:

'I certify that the claim is made in good faith; that the supporting data are accurate and complete to the best of my knowledge and belief; that the amount requested accurately reflects the contract adjustment for which the Contractor believes the Government is liable; and that I am duly authorized to certify the claim on behalf of the Contractor.'

(3) The certification may be executed by any person duly authorized to bind the Contractor with respect to the claim.

(e) For Contractor claims of \$100,000 or less, the Contracting Officer must, if requested in writing by the Contractor, render a decision within 60 days of the request. For Contractor-certified claims over \$100,000, the Contracting Officer must, within 60 days, decide the claim or notify the Contractor of the date by which the decision will be made.

(f) The Contracting Officer's decision shall be final unless the Contractor appeals or files a suit as provided in the Act.

(g) If the claim by the Contractor is submitted to the Contracting Officer or a claim by the Government is presented to the Contractor, the parties, by mutual consent, may agree to use alternative dispute resolution (ADR). If the Contractor refuses an offer for ADR, the Contractor shall inform the Contracting Officer, in writing, of the Contractor's specific reasons for rejecting the offer.

(h) The Government shall pay interest on the amount found due and unpaid from (1) the date the Contracting Officer receives the claim (certified if required), or (2) the date that payment otherwise would be due, if that date is later, until the date of payment. With regard to claims having defective certifications, as defined in (FAR) 48 CFR 33.201, interest shall be paid from the date that the Contracting Officer initially receives the claim. Simple interest on claims shall be paid at the rate, fixed by the Secretary of the Treasury as provided in the Act, which is applicable to the period during which the Contracting Officer receives the claim and then at the rate applicable for each 6-month period as fixed by the Treasury Secretary during the pendency of the claim.

(i) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under the contract, and comply with any decision of the Contracting Officer.

86. *FAR 52.233-3 PROTEST AFTER AWARD (AUG 1996)

(a) Upon receipt of a notice of protest (as defined in FAR 33.101) or a determination that a protest is likely (see FAR 33.102(d)), the Contracting Officer may, by written order to the Contractor, direct the Contractor to stop performance of the work called for by this contract. The order shall be specifically identified as a stop-work order issued under this clause. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Upon receipt of the final decision in the protest, the Contracting Officer shall either--

(1) Cancel the stop-work order; or

(2) Terminate the work covered by the order as provided in the Default, or the Termination for Convenience of the Government, clause of this contract.

(b) If a stop-work order issued under this clause is canceled either before or after a final decision in the protest, the Contractor shall resume work. The Contracting Officer shall make an equitable adjustment in the delivery schedule or contract price, or both, and the contract shall be modified, in writing, accordingly, if--

(1) The stop-work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this contract; and

(2) The Contractor asserts its right to an adjustment within 30 days after the end of the period of work stoppage; provided, that if the Contracting Officer decides the facts justify the action, the Contracting Officer may receive and act upon a proposal at any time before final payment under this contract.

(c) If a stop-work order is not canceled and the work covered by the order is terminated for the convenience of the Government, the Contracting Officer shall allow reasonable costs resulting from the stop-work order in arriving at the termination settlement.

(d) If a stop-work order is not canceled and the work covered by the order is terminated for default, the Contracting Officer shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop-work order.

(e) The Government's rights to terminate this contract at any time are not affected by action taken under this clause.

(f) If, as the result of the Contractor's intentional or negligent misstatement, misrepresentation, or miscertification, a protest related to this contract is sustained, and the Government pays costs, as provided in FAR 33.102(b)(2) or 33.104(h)(1), the Government may require the Contractor to reimburse the Government the amount of such costs. In addition to any other remedy available, and pursuant to the requirements of Subpart 32.6, the Government may collect this debt by offsetting the amount against any payment due the Contractor under any contract between the Contractor and the Government.

87. RESERVED

88. FAR 52.236-2 DIFFERING SITE CONDITIONS (APR 1984)

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of

(1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or

(2) unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, an equitable adjustment shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required, provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

89. *FAR 52.236-3 SITE INVESTIGATION AND CONDITIONS AFFECTING THE WORK (APR 1984)

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to

- (1) conditions bearing upon transportation, disposal, handling, and storage of materials;
- (2) the availability of labor, water, electric power, and roads;
- (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site;
- (4) the conformation and conditions of the ground; and
- (5) the character of equipment and facilities needed preliminary to and during work

performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the Government, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the Government.

(b) The Government assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Government. Nor does the Government assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

90. *FAR 52.236-5 MATERIAL AND WORKMANSHIP (APR 1984)

(a) All equipment, material, and articles incorporated into the work covered by this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. When directed to do so, the Contractor shall submit samples for approval at the Contractor's expense, with all shipping charges prepaid. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(c) All work under this contract shall be performed in a skillful and workmanlike manner. The Contracting Officer may require, in writing, that the Contractor remove from the work any employee the Contracting Officer deems incompetent, careless, or otherwise objectionable.

91. *FAR 52.232-33 PAYMENT BY ELECTRONIC FUNDS TRANSFER –CENTRAL CONTRACTOR REGISTRATION (MAY 1999)

(a) *Method of payment.* (1) All payments by the Government under this contract shall be made by electronic funds transfer (EFT), except as provided in paragraph (a)(2) of this clause. As used in this clause, the term “EFT” refers to the funds transfer and may also include the payment information transfer.

(2) In the event the Government is unable to release one or more payments by EFT, the Contractor agrees to either—

(i) Accept payment by check or some other mutually agreeable method of payment; or

(ii) Request the Government to extend the payment due date until such time as the Government can make payment by EFT (but see paragraph (d) of this clause).

(b) *Contractor’s EFT information.* The Government shall make payment to the Contractor using the EFT information contained in the Central Contractor Registration (CCR) database. In the event that the EFT information changes, the Contractor shall be responsible for providing the updated information to the CCR database.

(c) *Mechanisms for EFT payment.* The Government may make payment by EFT through either the Automated Clearing House (ACH) network, subject to the rules of the National Automated Clearing House Association, or the Fedwire Transfer System. The rules governing Federal payments through the ACH are contained in 31 CFR part 210.

(d) *Suspension of payment.* If the Contractor’s EFT information in the CCR database is incorrect, then the Government need not make payment to the Contractor under this contract until correct EFT information is entered into the CCR database; and any invoice or contract financing request shall be deemed not to be a proper invoice for the purpose of prompt payment under this contract. The prompt payment terms of the contract regarding notice of an improper invoice and delays in accrual of interest penalties apply.

(e) *Contractor EFT arrangements.* If the Contractor has identified multiple payment receiving points (i.e., more than one remittance address and/or EFT information set) in the CCR database, and the Contractor has not notified the Government of the payment receiving point applicable to this contract, the Government shall make payment to the first payment receiving point (EFT information set or remittance address as applicable) listed in the CCR database.

(f) *Liability for uncompleted or erroneous transfers.* (1) If an uncompleted or erroneous transfer occurs because the Government used the Contractor’s EFT information incorrectly, the Government remains responsible for—

(i) Making a correct payment;

(ii) Paying any prompt payment penalty due; and

(iii) Recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because the Contractor’s EFT information was incorrect, or was revised within 30 days of Government release of the EFT payment transaction instruction to the Federal Reserve System, and—

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Contractor is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government shall not make payment, and the provisions of paragraph (d) of this clause shall apply.

(g) *EFT and prompt payment.* A payment shall be deemed to have been made in a timely manner in accordance with the prompt payment terms of this contract if, in the EFT payment transaction instruction released to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(h) *EFT and assignment of claims.* If the Contractor assigns the proceeds of this contract as provided for in the assignment of claims terms of this contract, the Contractor shall require as a condition of any such assignment, that the assignee shall register in the CCR database and shall be paid by EFT in accordance with the terms of this

clause. In all respects, the requirements of this clause shall apply to the assignee as if it were the Contractor. EFT information that shows the ultimate recipient of the transfer to be other than the Contractor, in the absence of a proper assignment of claims acceptable to the Government, is incorrect EFT information within the meaning of paragraph (d) of this clause.

(i) *Liability for change of EFT information by financial agent.* The Government is not liable for errors resulting from changes to EFT information made by the Contractor's financial agent.

(j) *Payment information.* The payment or disbursing office shall forward to the Contractor available payment information that is suitable for transmission as of the date of release of the EFT instruction to the Federal Reserve System. The Government may request the Contractor to designate a desired format and method(s) for delivery of payment information from a list of formats and methods the payment office is capable of executing. However, the Government does not guarantee that any particular format or method of delivery is available at any particular payment office and retains the latitude to use the format and delivery method most convenient to the Government. If the Government makes payment by check in accordance with paragraph (a) of this clause, the Government shall mail the payment information to the remittance address contained in the CCR database.
(End of Clause)

92. *FAR 52.236-6 SUPERINTENDENCE BY THE CONTRACTOR (APR 1984)

At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

93. FAR 52.236-7 PERMITS AND RESPONSIBILITIES (NOV 1991)

The Contractor shall, without additional expense to the Government, be responsible for obtaining any necessary licenses and permits, and for complying with any Federal, State, and municipal laws, codes, and regulations applicable to the performance of the work. The Contractor shall also be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

94. *FAR 52.236-8 OTHER CONTRACTS (APR 1984)

The Government may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with Government employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by Government employees.

95. *FAR 52.236-9 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS (APR 1984)

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor

shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

- (b) The Contractor shall protect from damage all existing improvements and utilities
 - (1) at or near the work site, and
 - (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refused to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

96. *FAR 52.236-10 OPERATIONS AND STORAGE AREAS (APR 1984)

- (a) The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- (b) Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- (c) The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

97. *FAR 52.236-11 USE AND POSSESSION PRIOR TO COMPLETION (APR 1984)

- (a) The Government shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the Government intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The Government's possession or use shall not be deemed an acceptance of any work under the contract.
- (b) While the Government has such possession or use, the Contractor shall be relieved of the responsibility for the loss of or damage to the work resulting from the Government's possession or use, notwithstanding the terms of the clause in this contract entitled "Permits and Responsibilities." If prior possession or use by the Government delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

98. *FAR 52.236-12 CLEANING UP (APR 1984)

The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. Before completing the work, the Contractor shall remove from the work and premises any rubbish, tools, scaffolding, equipment, and materials that are not the property of the Government. Upon completing the work, the Contractor shall leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer.

99. *FAR 52.236-13 ACCIDENT PREVENTION-ALTERNATE I (NOV 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will (1) safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities; (2) avoid interruptions of Government operations and delays in project completion dates; and (3) control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall--

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontractors.

(f) Before commencing the work, the Contractor shall--

(1) Submit a written proposed plan for implementing this clause. The plan shall include an analysis of the significant hazards to life, limb, and property inherent in contract work performance and a plan for controlling these hazards; and

(2) Meet with representatives of the Contracting Officer to discuss and develop a mutual understanding relative to administration of the overall safety program.

100.*FAR 52.236-14 AVAILABILITY AND USE OF UTILITY SERVICES (APR 1984)

(a) The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Government or, where the utility is produced by the Government, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

101.FAR 52.236-15**SCHEDULES FOR CONSTRUCTION CONTRACTS (APR 1984)**

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as directed by the Contracting Officer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Contracting Officer. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the Government. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the default terms of this contract.

102.*FAR 52.236-17**LAYOUT OF WORK (APR 1984)**

The Contractor shall lay out its work from Government-established base lines and bench marks indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the Contracting Officer until authorized to remove them. If such marks are destroyed by the Contractor or through its negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

103.FAR 52.236-21**SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FEB 1997)**

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed," "required," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the "direction," "requirement," "order," "designation," or "prescription," of the Contracting Officer is intended and similarly the words "approved," "acceptable," "satisfactory," or words of like import shall mean "approved by," or "acceptable to," or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown," "as indicated," "as detailed," or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place," that is "furnished and installed."

(d) Shop drawings means drawings, submitted to the Government by the Contractor, subcontractor, or any lower tier subcontractor pursuant to a construction contract, showing in detail

(1) the proposed fabrication and assembly of structural elements, and

(2) the installation (i.e., fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The Government may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the Government's reasons therefor. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Contracting Officer approves any such variation, the Contracting Officer shall issue an appropriate contract modification, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the Contracting Officer and one set will be returned to the Contractor.

104. *FAR 52.236-26 PRECONSTRUCTION CONFERENCE (FEB 1995)

If the Contracting Officer decides to conduct a preconstruction conference, the successful offeror will be notified and will be required to attend. The Contracting Officer's notification will include specific details regarding the date, time, and location of the conference, any need for attendance by subcontractors, and information regarding the items to be discussed.

105. DFARS 252.236-7000 MODIFICATION OF PROPOSALS - PRICE BREAKDOWN (DEC 1991)

(a) The Contractor shall furnish a price breakdown, itemized as required and within the time specified by the Contracting Officer, with any proposal for a contract modification.

(b) The price breakdown--

(1) Must include sufficient detail to permit an analysis of profit, and of all costs for--

(i) Material;

(ii) Labor,

(iii) Equipment;

(iv) Subcontracts; and

(2) Must cover all work involved in the modification, whether the work was deleted, added, or changed.

(c) The Contractor shall provide similar price breakdowns to support any amounts claimed for subcontracts.

(d) The Contractor's proposal shall include a justification for any time extension proposed.

106. DFARS 252.236-7008 CONTRACT PRICES - BIDDING SCHEDULES (DEC 1991)

(a) The Government's payment for the items listed in the Bidding Schedule shall constitute full compensation to the Contractor for--

- (1) Furnishing all plant, labor, equipment, appliances, and materials; and
- (2) Performing all operations required to complete the work in conformity with the drawings and specifications.

(b) The Contractor shall include in the prices for the items listed in the Bidding Schedule all costs for work in the specifications, whether or not specifically listed in the Bidding Schedule.

107. *FAR 52.242-13 BANKRUPTCY (JUL 1995)

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the contract, written notification of the bankruptcy to the Contracting Officer responsible for administering the contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of Government contract numbers and contracting offices for all Government contracts against which final payment has not been made. This obligation remains in effect until final payment under this contract.

108. *FAR 52.242-14 SUSPENSION OF WORK (APR 1984)

(a) The Contracting Officer may order the Contractor, in writing, to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the Government.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified in this contract (or within a reasonable time if not specified), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by the unreasonable suspension, delay, or interruption, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor, or for which an equitable adjustment is provided for or excluded under any other term or condition of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order), and (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

109. FAR 52.243-4 CHANGES (AUG 1987)

(a) The Contracting Officer may, at any time, without notice to the sureties, if any, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract, including changes--

- (1) In the specifications (including drawings and designs);
- (2) In the method or manner of performance of the work;
- (3) In the Government-furnished facilities, equipment, materials, services, or site; or

- (4) Directing acceleration in the performance of the work.
- (b) Any other written or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating
 - (1) the date, circumstances, and source of the order and
 - (2) that the Contractor regards the order as a change order.
- (c) Except as provided in this clause, no order, statement, or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.
- (d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for, the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for an adjustment based on defective specifications, no adjustment for any change under paragraph (b) of this clause shall be made for any costs incurred more than 20 days before the Contractor gives written notice as required. In the case of defective specifications for which the Government is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.
- (e) The Contractor must assert its right to an adjustment under this clause within 30 days after
 - (1) receipt of a written change order under paragraph (a) of this clause or
 - (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting to the Contracting Officer a written statement describing the general nature and amount of the proposal, unless this period is extended by the Government. The statement of proposal for adjustment may be included in the notice under paragraph (b) above.
- (f) No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

110. DFARS 252.243-7001 PRICING OF CONTRACT MODIFICATIONS (DEC 1991)

When costs are a factor in any price adjustment under this contract, the contract cost principles and procedures in FAR Part 31 and DFARS Part 231, in effect on the date of this contract, apply.

111. DFARS 252.243-7002 REQUESTS FOR EQUITABLE ADJUSTMENT (MAR 1998)

(a) The amount of any request for equitable adjustment to contract terms shall accurately reflect the contract adjustment for which the Contractor believes the Government is liable. The request shall include only costs for performing the change, and shall not include any costs that already have been reimbursed or that have been separately claimed. All indirect costs included in the request shall be properly allocable to the change in accordance with applicable acquisition regulations.

(b) In accordance with 10 U.S.C. 2410(a), any request for equitable adjustment to contract terms that exceeds the simplified acquisition threshold shall bear, at the time of submission, the following certificate executed by an individual authorized to certify the request on behalf of the Contractor:
I certify that the request is made in good faith, and that the supporting data are accurate and complete to the best of my knowledge and belief.

(Official's Name)

(Title)

(c) The certification in paragraph (b) of this clause requires full disclosure of all relevant facts, including--

(1) Cost or pricing data if required in accordance with subsection 15.403-4 of the Federal Acquisition Regulation; and

(2) Information other than cost or pricing data, in accordance with subsection 15.403-3 of the FAR, including actual cost data and data to support any estimated costs, even if cost or pricing data are not required.

(d) The certification requirement in paragraph (b) of this clause does not apply to---

(1) Requests for routine contract payments; for example, requests for payment for accepted supplies and services, routine vouchers under a cost-reimbursement type contract, or progress payment invoices; or

(2) Final adjustment under an incentive provision of the contract.

(End of clause)

112. *FAR 52.244-2 SUBCONTRACTS (AUG 1998)

(a) Definitions. As used in this clause--

"Approved purchasing system" means a Contractor's purchasing system that has been reviewed and approved in accordance with Part 44 of the Federal Acquisition Regulation (FAR).

"Consent of subcontract" means the Contracting Officer's written consent for the Contractor to enter into a particular subcontract.

"Subcontract," means any contract, as defined in FAR Subpart 2.1, entered into by a subcontractor to furnish supplies or services for performance of the the prime contract or a subcontract. It includes, but is not limited to purchase orders, and changes and modifications to purchase orders.

(b) This clause does not apply to subcontracts for special test equipment when the contract contains the clause at FAR 52.245-18, Special Test Equipment.

(c) When this clause is included in a fixed-price type contract, consent to subcontract is required only on unpriced contract actions (including unpriced modification or unpriced delivery orders), and only if required in accordance with paragraph (d) or (e) of this clause.

(d) If the Contractor does not have an approved purchasing system, consent to subcontract is required for any subcontract that--

(1) Is of the cost-reimbursement, time-and-materials, or labor-hour type; or

(2) Is fixed-price and exceeds--

(i) For a contract awarded by the Department of Defense, the Coast Guard, or the National Aeronautics and Space Administration, the greater of the simplified threshold or 5 percent of the total estimated cost of the contract; or

(ii) For a contract awarded by a civilian agency other than the Coast Guard and the National Aeronautics and Space Administration, either the the simplified threshold or 5 percent of the total estimated cost of the contract.

(e) If the Contractor has an approved purchasing system, the Contractor nevertheless shall obtain the Contracting Officer's written consent before placing the following subcontracts:

(f)(1) The Contractor shall notify the Contracting Officer reasonably in advance of placing any subcontract or modification thereof for which consent is required under paragraph (c), (d), or (e) of this clause, including the following information:

- (i) A description of the supplies or services to be subcontracted.
- (ii) Identification of the type of subcontract to be used.
- (iii) Identification of the proposed subcontractor.
- (iv) The proposed subcontract price.
- (v) The subcontractor's current, complete, and accurate cost or pricing data and Certificate of Current Cost or Pricing Data, if required by other contract provisions.
- (vi) The subcontractor's Disclosure Statement or Certificate relating to Cost Accounting Standards when such data are required by other provisions of this contract.
- (vii) A negotiation memorandum reflecting--
 - (A) The principal elements of the subcontract price negotiations;
 - (B) The most significant considerations controlling establishment of initial or revised prices;
 - (C) The reason cost or pricing data were or were not required;
 - (D) The extent, if any, to which the Contractor did not rely on the subcontractor's cost or pricing data in determining the price objective and in negotiating the final price;
 - (E) The extent to which it was recognized in the negotiation that the subcontractor's cost or pricing data were not accurate, complete, or current; the action taken by the Contractor and subcontractor; and the effect of any such defective data on the total price negotiated;
 - (F) The reasons for any significant difference between the Contractor's price objective and the price negotiated; and
 - (G) A complete explanation of the incentive fee or profit plan when incentives are used. The explanation shall identify each critical performance element, management decisions used to quantify each incentive element, reasons for the incentives, and a summary of all trade-off possibilities considered.

(2) The Contractor is not required to notify the Contracting Officer in advance of entering into any subcontract for which consent is not required under paragraph (c), (d), or (e) of this clause.

(g) Unless the consent or approval specifically provides otherwise, neither consent by the Contracting Officer to any subcontract nor approval of the Contractor's purchasing system shall constitute a determination--

- (1) Of the acceptability of any subcontract terms or conditions;
- (2) Of the acceptability of any cost under this contract; or
- (3) To relieve the Contractor of any responsibility for performing this contract.

(h) No subcontract or modification thereof placed under this contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement subcontracts shall not exceed the fee limitations in FAR 15.404-4(c)(4)(i).

(i) The Contractor shall give the Contracting Officer immediate written notice of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor that, in the opinion of the Contractor, may result in litigation related in any way to this contract, with respect to which the Contractor may be entitled to reimbursement by the Government.

(j) The Government reserves the right to review the Contractor's purchasing system as set forth in FAR Subpart 44.3.

(k) Paragraphs (d) and (f) of this clause do not apply to the following subcontracts, which were evaluated during negotiations:

(End of clause)

113. FAR 52.244-6 SUBCONTRACTS FOR COMMERCIAL ITEMS (MAY 2001)

(a) *Definitions.* As used in this clause—

“Commercial item” has the meaning contained in the clause at 52.202-1, Definitions.

“Subcontract” includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.

(b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.

(c)(1) The following clauses shall be flowed down to subcontracts for commercial items:

(i) 52.219-8, Utilization of Small Business Concerns (OCT 2000) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer sub-contracting opportunities.

(ii) 52.222-26, Equal Opportunity (FEB 1999) (E.O. 11246).

(iii) 52.222-35, Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (APR 1998) (38 U.S.C. 4212(a)).

(iv) 52.222-36, Affirmative Action for Workers with Disabilities (JUN 1998) (29 U.S.C. 793).

(v) 52.247-64, Preference for Privately Owned U.S.-Flagged Commercial Vessels (JUN 2000) (46 U.S.C. Appx 1241) (flowdown not required for subcontracts awarded beginning May 1, 1996).

(2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of clause)

114. *FAR 52.245-2 GOVERNMENT PROPERTY (FIXED-PRICE CONTRACTS) (DEC 1989) [For Government Property over \$100,000]

(a) Government-furnished property.

(1) The Government shall deliver to the Contractor, for use in connection with and under the terms of this contract, the Government-furnished property described in the Schedule or specifications together with any related data and information that the Contractor may request and is reasonably required for the intended use of the property (hereinafter referred to as "Government-furnished property").

(2) The delivery or performance dates for this contract are based upon the expectation that Government-furnished property suitable for use (except for property furnished "as is") will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the contract's delivery or performance dates.

(3) If Government-furnished property is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt of it, notify the Contracting Officer, detailing the facts, and, as directed by the Contracting Officer and at Government expense, either repair, modify, return, or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, the Contracting Officer shall make an equitable adjustment as provided in paragraph (h) of this clause.

(4) If Government-furnished property is not delivered to the Contractor by the required time, the Contracting Officer shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(b) Changes in Government-furnished property.

(1) The Contracting Officer may, by written notice,

(i) decrease the Government-furnished property provided or to be provided under this contract, or

(ii) substitute other Government-furnished property for the property to be provided by the Government, or to be acquired by the Contractor for the Government, under this contract. The Contractor

shall promptly take such action as the Contracting Officer may direct regarding the removal, shipment, or disposal of the property covered by such notice.

(2) Upon the Contractor's written request, the Contracting Officer shall make an equitable adjustment to the contract in accordance with paragraph (h) of this clause, if the Government has agreed in the Schedule to make the property available for performing this contract and there is any--

(i) Decrease or substitution in this property pursuant to subparagraph (b)(1) above;
or
(ii) Withdrawal of authority to use this property, if provided under any other contract or lease.

(c) Title in Government property.

(1) The Government shall retain title to all Government-furnished property.

(2) All Government-furnished property and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this clause. However, special tooling accountable to this contract is subject to the provisions of the Special Tooling clause and is not subject to the provisions of this clause. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall government property become a fixture or lose its identity as personal property by being attached to any real property.

(3) Title to each item of facilities and special test equipment acquired by the Contractor for the Government under this contract shall pass to and vest in the Government when its use in performing this contract commences or when the Government has paid for it, whichever is earlier, whether or not title previously vested in the Government.

(4) If this contract contains a provision directing the Contractor to purchase material for which the Government will reimburse the Contractor as a direct item of cost under this contract--

(i) Title to material purchased from a vendor shall pass to and vest in the Government upon the vendor's delivery of such material; and

(ii) Title to all other material shall pass to and vest in the Government upon--

(A) Issuance of the material for use in contract performance;

(B) Commencement of processing of the material or its use in contract

performance; or

(C) Reimbursement of the cost of the material by the Government, whichever occurs first.

(d) Use of Government property. The Government property shall be used only for performing this contract, unless otherwise provided in this contract or approved by the Contracting Officer.

(e) Property Administration.

(1) The Contractor shall be responsible and accountable for all Government property provided under this contract and shall comply with Federal Acquisition Regulation (FAR) Subpart 45.5, as in effect on the date of this contract.

(2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound industrial practice and the applicable provisions of Subpart 45.5 of the FAR.

(3) If damage occurs to Government property, the risk of which has been assumed by the Government under this contract, the Government shall replace the items or the Contractor shall make such repairs as the Government directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by the Contracting Officer. When any property for which the Government is responsible is replaced or repaired, the Contracting Officer shall make an equitable adjustment in accordance with paragraph (h) of this clause.

(4) The Contractor represents that the contract price does not include any amount for repairs or replacement for which the Government is responsible. Repair or replacement of property for which the Contractor is responsible shall be accomplished by the Contractor at its own expense.

(f) Access. The Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Risk of loss. Unless otherwise provided in this contract, the Contractor assumes the risk of, and shall be responsible for, any loss or destruction of, or damage to, Government property upon its delivery to the

Contractor or upon passage of title to the Government under paragraph (c) of this clause. However, the Contractor is not responsible for reasonable wear and tear to Government property or for Government property properly consumed in performing this contract.

(h) Equitable adjustment. When this clause specifies an equitable adjustment, it shall be made to any affected contract provision in accordance with the procedures of the Changes clause. When appropriate, the Contracting Officer may initiate an equitable adjustment in favor of the Government. The right to an equitable adjustment shall be the Contractor's exclusive remedy. The Government shall not be liable to suit for breach of contract for--

- (1) Any delay in delivery of Government-furnished property;
- (2) Delivery of Government-furnished property in a condition not suitable for its intended use;
- (3) A decrease in or substitution of Government-furnished property; or
- (4) Failure to repair or replace Government property for which the Government is responsible.

(i) Final accounting and disposition of Government property. Upon completing this contract, or at such earlier dates as may be fixed by the Contracting Officer, the Contractor shall submit, in a form acceptable to the Contracting Officer, inventory schedules covering all items of Government property (including any resulting scrap) not consumed in performing this contract or delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as the Contracting Officer directs.

(j) Abandonment and restoration of Contractor's premises. Unless otherwise provided herein, the Government--

- (1) May abandon any Government property in place, at which time all obligations of the Government regarding such abandoned property shall cease; and
- (2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or upon contract completion). However, if the Government-furnished property (listed in the Schedule or specifications) is withdrawn or is unsuitable for the intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this clause may properly include restoration or rehabilitation costs.

(k) Communications. All communications under this clause shall be in writing.

(l) Overseas contracts. If this contract is to be performed outside of the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

115. *FAR 52.245-4 GOVERNMENT-FURNISHED PROPERTY (SHORT FORM) (APR 1984)
[For Government Property \$100,000 or Less]

(a) The Government shall delivery to the Contractor, at the time and locations stated in this contract, the Government-furnished property described in the Schedule or specifications. If that property, suitable for its intended use, is not delivered to the Contractor, the Contracting Officer shall equitably adjust affected provisions of this contract in accordance with the Changed clause when--

- (1) The Contractor submits a timely written request for an equitable adjustment; and
- (2) The facts warrant an equitable adjustment.

(b) Title to Government-furnished property shall remain in the Government. The Contractor shall use the Government-furnished property only in connection with this contract. The Contractor shall maintain adequate property control records in accordance with sound industrial practice and will make such records available for Government inspection at all reasonable times, unless the clause at Federal Acquisition Regulation 52.245-1, Property Records, is included in this contract.

(c) Upon delivery of Government-furnished property to the Contractor, the Contractor assumes the risk and responsibility for its loss or damage, except--

- (1) For reasonable wear and tear;
- (2) To the extent property is consumed in performing this contract; or
- (3) As otherwise provided for by the provisions of this contract.

(d) Upon completing this contract, the Contractor shall follow the instructions of the Contracting Officer regarding the disposition of all Government-furnished property not consumed in performing this contract or previously delivered to the Government. The Contractor shall prepare for shipment, deliver f.o.b. origin, or dispose of the Government property, as may be directed or authorized by the Contracting Officer. The net proceeds of any such disposal shall be credited to the contract price or shall be paid to the Government as directed by the Contracting Officer.

(e) If this contract is to be performed outside the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (wherever they appear in this clause) shall be construed as "United States Government" and "United States Government-furnished," respectively.

116. *FAR 52.246-12 INSPECTION OF CONSTRUCTION (AUG 1996)

(a) Definition. "Work" includes, but is not limited to, materials, workmanship, and manufacture and fabrication of components.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. The Contractor shall maintain complete inspection records and make them available to the Government. All work shall be conducted under the general direction of the Contracting Officer and is subject to Government inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) Government inspections and tests are for the sole benefit of the Government and do not--

(1) Relieve the Contractor of responsibility for providing adequate quality control measures;

(2) Relieve the Contractor of responsibility for damage to or loss of the material before acceptance;

(3) Constitute or imply acceptance; or

(4) Affect the continuing rights of the Government after acceptance of the completed work under paragraph (i) below.

(d) The presence or absence of a Government inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specification without the Contracting Officer's written authorization.

(e) The Contractor shall promptly furnish, at no increase in contract price, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The Government may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The Government shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The Contractor shall, without charge, replace or correct work found by the Government not to conform to contract requirements, unless in the public interest the Government consents to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(g) If the Contractor does not promptly replace or correct rejected work, the Government may

(1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor or

(2) Terminate for default the Contractor's right to proceed.

(h) If, before acceptance of the entire work, the Government decides to examine already completed work by removing it or tearing it out, the Contractor, on request, shall promptly furnish all necessary facilities, labor, and material. If the work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray the expenses of the examination and of satisfactory reconstruction. However, if the work is found to meet contract requirements, the Contracting Officer shall make an equitable adjustment for the additional services involved in the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(i) Unless otherwise specified in the contract, the Government shall accept, as promptly as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer

determines can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Government's rights under any warranty or guarantee.

117. *FAR 52.246-21 WARRANTY OF CONSTRUCTION (MAR 1994)

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

- (1) The Contractor's failure to conform to contract requirements; or
- (2) Any defect of equipment, material, workmanship, or design furnished.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement.

(e) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage.

(f) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(g) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

- (1) Obtain all warranties that would be given in normal commercial practice;
- (2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and
- (3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(h) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(i) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(j) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

118. DFARS 252.247-7023 TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) Definitions.

As used in this clause--

(1) "Components" means articles, materials, and supplies incorporated directly into end products at any level of manufacture, fabrication, or assembly by the Contractor or any subcontractor.

(2) "Department of Defense" (DOD) means the Army, Navy, Air Force, Marine Corps, and defense agencies.

(3) "Foreign flag vessel" means any vessel that is not a U.S.-flag vessel.

(4) "Ocean transportation" means any transportation aboard a ship, vessel, boat, barge, or ferry through international waters.

(5) "Subcontractor" means a supplier, materialman, distributor, or vendor at any level below the prime Contractor whose contractual obligation to perform results from, or is conditioned upon, award of the prime contract and who is performing any part of the work or other requirement of the prime contract.

(6) "Supplies" means all property, except land and interests in land, that is clearly identifiable for eventual use by or owned by the DoD at the time of transportation by sea.

(i) An item is clearly identifiable for eventual use by the DoD if, for example, the contract documentation contains a reference to a DoD contract number or a military destination.

(ii) "Supplies" includes (but is not limited to) public works; buildings and facilities; ships; floating equipment and vessels of every character, type, and description, with parts, subassemblies, accessories, and equipment; machine tools; material; equipment; stores of all kinds; end items; construction materials; and components of the foregoing.

(7) "U.S.-flag vessel" means a vessel of the United States or belonging to the United States, including any vessel registered or having national status under the laws of the United States.

(b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.

(2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--

(i) This Contract is a construction contract; or

(ii) The supplies being transported are--

(A) Noncommercial items; or

(B) Commercial items that--

(1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);

(2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or

(3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

(c) The Contractor and its subcontractors may request that the Contracting Officer authorize shipment in foreign-flag vessels, or designate available U.S.-flag vessels, if the Contractor or a subcontractor believes that--

(1) U.S.-flag vessels are not available for timely shipment;

(2) The freight charges are inordinately excessive or unreasonable; or

(3) Freight charges are higher than charges to private persons for transportation of like goods.

(d) The Contractor must submit any request for use of other than U.S.-flag vessels in writing to the Contracting Officer at least 45 days prior to the sailing date necessary to meet its delivery schedules. The Contracting Officer will process requests submitted after such date(s) as expeditiously as possible, but the Contracting Officer's failure to grant approvals to meet the shipper's sailing date will not of itself constitute a compensable delay under this or any other clause of this contract. Requests shall contain at a minimum--

(1) Type, weight, and cube of cargo;

(2) Required shipping date;

(3) Special handling and discharge requirements;

(4) Loading and discharge points;

(5) Name of shipper and consignee;

(6) Prime contract number, and
(7) A documented description of efforts made to secure U.S.-flag vessels, including points of contact (with names and telephone numbers) with at least two U.S.-flag carriers contacted. Copies of telephone notes, telegraphic and facsimile message or letters will be sufficient for this purpose.

(e) The Contractor shall, within 30 days after each shipment covered by this clause, provide the Contracting Officer and the Division of National Cargo, Office of Market Development, Maritime Administration, U.S. Department of Transportation, Washington, DC 20590, one copy of the rated on board vessel operating carrier's ocean bill of lading, which shall contain the following information--

- (1) Prime contract number;
- (2) Name of vessel;
- (3) Vessel flag of registry;
- (4) Date of loading;
- (5) Port of loading;
- (6) Port of final discharge;
- (7) Description of commodity;
- (8) Gross weight in pounds and cubic feet if available;
- (9) Total ocean freight in U.S. dollars; and
- (10) Name of the steamship company.

(f) The Contractor agrees to provide with its final invoice under this contract a representation that to the best of its knowledge and belief--

- (1) No ocean transportation was used in the performance of this contract;
- (2) Ocean transportation was used and only U.S.-flag vessels were used for all ocean shipments under the contract;
- (3) Ocean transportation was used, and the Contractor had the written consent of the Contracting Officer for all non-U.S.-flag ocean transportation; or
- (4) Ocean transportation was used and some or all of the shipments were made on non-U.S.-flag vessels without the written consent of the Contracting Officer. The Contractor shall describe these shipments in the following format;

ITEM DESCRIPTION	CONTRACT LINE ITEMS	QUANTITY
---------------------	------------------------	----------

TOTAL

(g) If the final invoice does not include the required representation, the Government will reject and return it to the Contractor as an improper invoice for the purposes of the Prompt Payment clause of this contract. In the event there has been unauthorized use of non-U.S.-flag vessels in the performance of this contract, the Contracting Officer is entitled to equitably adjust the contract, based on the unauthorized use.

(h) The Contractor shall include this clause, including this paragraph (h) in all subcontracts under this contract that--

- (1) Exceed the simplified acquisition threshold in Part 2 of the Federal Acquisition Regulation; and
- (2) Are for a type of supplies described in paragraph (b) (2) of this clause.

119. DFARS 252.247-7024 NOTIFICATION OF TRANSPORTATION OF SUPPLIES BY SEA (MAR 2000)

(a) The Contractor has indicated by the response to the solicitation provision, Representation of Extent of Transportation by Sea, that it did not anticipate transporting by sea any supplies. If, however, after the award of this contract, the Contractor learns that supplies, as defined in the Transportation of Supplies by Sea clause of this contract, will be transported by sea, the Contractor--

- (1) Shall notify the Contracting Officer of that fact; and
- (2) Hereby agrees to comply with all the terms and conditions of the Transportation of Supplies by Sea clause of this contract.

- (b) (1) The Contractor shall use U.S. -flag vessels when transporting any supplies by sea under this contract.
- (2) A subcontractor transporting supplies by sea under this contract shall use U.S.-flag vessel if--
- (i) This Contract is a construction contract; or
 - (ii) The supplies being transported are--
 - (A) Noncommercial items; or
 - (B) Commercial items that--
 - (1) The Contractor is reselling or distributing to the Government without adding value (generally, the Contractor does not add value to items that it subcontracts for f.o.b. destination shipment);
 - (2) Are shipped in direct support of U.S. military contingency operations, exercises, or forces deployed in humanitarian or peacekeeping operations; or
 - (3) Are commissary or exchange cargoes transported outside of the Defense Transportation System in accordance with 10 U.S.C. 2643.

120. FAR 52.248-3 VALUE ENGINEERING--CONSTRUCTION (FEB 2000) (ALERNATE I (APR 1984)

(a) General. The Contractor is encouraged to develop, prepare, and submit value engineering change proposals (VECP's) voluntarily. The Contractor shall share in any instant contract savings realized from accepted VECP's, in accordance with paragraph (f) of this clause.

(b) Definitions. "Collateral costs," as used in this clause, means agency costs of operation, maintenance, logistic support, or Government-furnished property.

"Collateral savings," as used in this clause, means those measurable net reductions resulting from a VECP in the agency's overall projected collateral costs, exclusive of acquisition savings, whether or not the acquisition cost changes.

"Contractor's development and implementation costs," as used in this clause, means those costs the Contractor incurs on a VECP specifically in developing, testing, preparing, and submitting the VECP, as well as those costs the Contractor incurs to make the contractual changes required by Government acceptance of a VECP.

"Government costs," as used in this clause, means those agency costs that result directly from developing and implementing the VECP, such as any net increases in the cost of testing, operations, maintenance, and logistic support. The term does not include the normal administrative costs of processing the VECP.

"Instant contract savings," as used in this clause, means the estimated reduction in Contractor cost of performance resulting from acceptance of the VECP, minus allowable Contractor's development and implementation costs, including subcontractors' development and implementation costs (see paragraph (h) of this clause).

"Value engineering change proposal (VECP)" means a proposal that--

- (1) Requires a change to this, the instant contract, to implement; and
- (2) Results in reducing the contract price or estimated cost without impairing essential functions or characteristics; provided, that it does not involve a change--
 - (i) In deliverable end item quantities only; or
 - (ii) To the contract type only.

(c) VECP preparation. As a minimum, the Contractor shall include in each VECP the information described in paragraphs (c) (1) through (7) of this clause. If the proposed change is affected by contractually required configuration management or similar procedures, the instructions in those procedures relating to format, identification, and priority assignment shall govern VECP preparation. The VECP shall include the following:

- (1) A description of the difference between the existing contract requirement and that proposed, the comparative advantages and disadvantages of each, a justification when an item's function or characteristics are being altered, and the effect of the change on the end item's performance.
- (2) A list and analysis of the contract requirements that must be changed if the VECP is accepted, including any suggested specification revisions.

- (3) A separate, detailed cost estimate for
 - (i) the affected portions of the existing contract requirement and
 - (ii) the VECP. The cost reduction associated with the VECP shall take into account the Contractor's allowable development and implementation costs, including any amount attributable to subcontracts under paragraph (h) of this clause.
- (4) A description and estimate of costs the Government may incur in implementing the VECP, such as test and evaluation and operating and support costs.
- (5) A prediction of any effects the proposed change would have on collateral costs to the agency.
- (6) A statement of the time by which a contract modification accepting the VECP must be issued in order to achieve the maximum cost reduction, noting any effect on the contract completion time or delivery schedule.
- (7) Identification of any previous submissions of the VECP, including the dates submitted, the agencies and contract numbers involved, and previous Government actions, if known.
- (d) Submission. The Contractor shall submit VECP's to the Resident Engineer at the worksite, with a copy to the Contracting Officer.
- (e) Government action.
 - (1) The Contracting Officer will notify the Contractor of the status of the VECP within 45 calendar days after the contracting office receives it. If additional time is required, the Contracting Officer will notify the Contractor within the 45-day period and provide the reason for the delay and the expected date of the decision. The Government will process VECP's expeditiously; however, it will not be liable for any delay in acting upon a VECP.
 - (2) If the VECP is not accepted, the Contracting Officer will notify the Contractor in writing, explaining the reasons for rejection. The Contractor may withdraw any VECP, in whole or in part, at any time before it is accepted by the Government. The Contracting Officer may require that the Contractor provide written notification before undertaking significant expenditures for VECP effort.
 - (3) Any VECP may be accepted, in whole or in part, by the Contracting Officer's award of a modification to this contract citing this clause. The Contracting Officer may accept the VECP, even though an agreement on price reduction has not been reached, by issuing the Contractor a notice to proceed with the change. Until a notice to proceed is issued or a contract modification applied a VECP to this contract, the Contractor shall perform in accordance with the existing contract. The decision to accept or reject all or part of any VECP is a unilateral decision made solely at the discretion of the Contracting Officer.
- (f) Sharing.
 - (1) Rates. The Government's share of savings is determined by subtracting Government costs from instant contract savings and multiplying the result by
 - (i) 45 percent for fixed-price contracts or
 - (ii) 75 percent for cost-reimbursement contracts.
 - (2) Payment. Payment of any share due the Contractor for use of a VECP on this contract shall be authorized by a modification to this contract to--
 - (i) Accept the VECP;
 - (ii) Reduce the contract price or estimated cost by the amount of instant contract savings; and
 - (iii) Provide the Contractor's share of savings by adding the amount calculated to the contract price or fee.
- (g) Deleted.
- (h) Subcontracts. The Contractor shall include an appropriate value engineering clause in any subcontract of \$50,000 or more and may include one in subcontracts of lesser value. In computing any adjustment in this contract's price under paragraph (f) of this clause, the Contractor's allowable development and implementation costs clearly resulting from a VECP accepted by the Government under this contract, but shall exclude any value engineering incentive payments to a subcontractor. The Contractor may choose any arrangement for subcontractor value engineering incentive payments; provided, that these payments shall not reduce the Government's share of the savings resulting from the VECP.
- (i) Data. The Contractor may restrict the Government's right to use any part of a VECP or the supporting data by marking the following legend on the affected parts:

"These data, furnished under the Value Engineering--Construction clause of contract - _____, shall not be disclosed outside the Government or duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate a value engineering change proposal submitted under the clause. This restriction does not limit the Government's right to use information contained in these data if it has been obtained or is otherwise available from the Contractor or from another source without limitations."

If a VECP is accepted, the Contractor hereby grants the Government unlimited rights in the VECP and supporting data, except that, with respect to data qualifying and submitted as limited rights technical data, the Government shall have the rights specified in the contract modification implementing the VECP and shall appropriately mark the data. (The terms "unlimited rights" and "limited rights" are defined in Part 27 of the Federal Acquisition Regulation.)

(End of Clause)

121. *FAR 52.249-1 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) (SHORT FORM) (APR 1984) [For Contracts \$100,000 or Less]

The Contracting Officer, by written notice, may terminate this contract, in whole or in part, when it is in the Government's interest. If this contract is terminated, the rights, duties, and obligations of the parties, including compensation to the Contractor, shall be in accordance with Part 49 of the Federal Acquisition Regulation in effect on the date of this contract.

122. *FAR 52.249-2 TERMINATION FOR CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) ALTERNATE I (SEP 1996) [For Contracts Over \$100,000]

(a) The Government may terminate performance of work under this contract in whole or, from time to time, in part if the Contracting Officer determines that a termination is in the Government's interest. The Contracting Officer shall terminate by delivering to the Contractor a Notice of Termination specifying the extent of termination and the effective date.

(b) After receipt of a Notice of Termination, and except as directed by the Contracting Officer, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this clause:

- (1) Stop work as specified in the notice.
- (2) Place no further subcontracts or orders (referred to as subcontracts in this clause) for materials, services, or facilities, except as necessary to complete the continued portion of the contract.
- (3) Terminate all subcontracts to the extent they relate to the work terminated.
- (4) Assign to the Government, as directed by the Contracting Officer, all right, title, and interest of the Contractor under the subcontracts terminated, in which case the Government shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.
- (5) With approval or ratification to the extent required by the Contracting Officer, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts; the approval or ratification will be final for purposes of this clause.
- (6) As directed by the Contracting Officer, transfer title and deliver to the Government
 - (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, and
 - (ii) the completed or partially completed plans, drawings, information, and other property that, if the contract had been completed, would be required to be furnished to the Government.
- (7) Complete performance of the work not terminated.
- (8) Take any action that may be necessary, or that the Contracting Officer may direct, for the protection and preservation of the property related to this contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.
- (9) Use its best efforts to sell, as directed or authorized by the Contracting Officer, any property of the types referred to in subparagraph (b) (6) of this clause; provided, however, that the Contractor

(i) is not required to extend credit to any purchaser and
(ii) may acquire the property under the conditions prescribed by, and at prices approved by, the Contracting Officer. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Government under this contract, credited to the price or cost of the work, or paid in any other manner directed by the Contracting Officer.

(c) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120-day period.

(d) After expiration of the plant clearance period as defined in Subpart 45.6 of the Federal Acquisition Regulation, the Contractor may submit to the Contracting Officer a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by the Contracting Officer. The Contractor may request the Government to remove those items or enter into an agreement for their storage. Within 15 days, the Government will accept title to those items and remove them or enter into a storage agreement. The Contracting Officer may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.

(e) After termination, the Contractor shall submit a final termination settlement proposal to the Contracting Officer in the form and with the certification prescribed by the Contracting Officer. The Contractor shall submit the proposal promptly, but no later than 1 year from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 1 year period. However, if the Contracting Officer determines that the facts justify it, a termination settlement proposal may be received and acted on after 1 year or any extension. If the Contractor fails to submit the proposal within the time allowed, the Contracting Officer may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

(f) Subject to paragraph (e) of this clause, the Contractor and the Contracting Officer may agree upon the whole or any part of the amount to be paid because of the termination. The amount may include a reasonable allowance for profit on work done. However, the agreed amount, whether under this paragraph (f) or paragraph (g) of this clause, exclusive of costs shown in subparagraph (g)(3) of this clause, may not exceed the total contract price as reduced by (1) the amount of payments previously made and (2) the contract price of work not terminated. The contract shall be amended, and the Contractor paid the agreed amount. Paragraph (f) of this clause shall not limit, restrict, or affect the amount that may be agreed upon to be paid under this paragraph.

(g) If the Contractor and the Contracting Officer fail to agree on the whole amount to be paid the Contractor because of the termination of work, the Contracting Officer shall pay the Contractor the amounts determined as follows, but without duplication of any amounts agreed upon under paragraph (f) of this clause:

(1) For contract work performed before the effective date of the termination, the total (without duplication of any items) of--

(i) The cost of this work;
(ii) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the contract if not included in subdivision (g)(1)(i) of this clause; and
(iii) A sum, as profit on subdivision (g)(1)(i) of this clause, determined by the Contracting Officer under 49.202 of the Federal Acquisition Regulation, in effect on the date of this contract, to be fair and reasonable; however, if it appears that the Contractor would have sustained a loss on the entire contract had it been completed, the Contracting Officer shall allow no profit under this subdivision (iii) and shall reduce the settlement to reflect the indicated rate of loss.

(2) The reasonable costs of settlement of the work terminated, including--
(i) Accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data;
(ii) The termination and settlement of subcontracts (excluding the amounts of such settlements); and
(iii) Storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory.

(h) Except for normal spoilage, and except to the extent that the Government expressly assumed the risk of loss, the Contracting Officer shall exclude from the amounts payable to the Contractor under paragraph (g) of

this clause, the fair value, as determined by the Contracting Officer, of property that is destroyed, lost, stolen, or damaged so as to become undeliverable to the Government or to a buyer.

(i) The cost principles and procedures of Part 31 of the Federal Acquisition Regulation, in effect on the date of this contract, shall govern all costs claimed, agreed to, or determined under this clause.

(j) The Contractor shall have the right of appeal, under the Disputes clause, from any determination made by the Contracting Officer under paragraph (e), (g), or (l) of this clause, except that if the Contractor failed to submit the termination settlement proposal within the time provided in paragraph (e) or (l), respectively, and failed to request a time extension, there is no right of appeal.

(k) In arriving at the amount due the Contractor under this clause, there shall be deducted--

(1) All unliquidated advance or other payments to the Contractor under the terminated portion of this contract;

(2) Any claim which the Government has against the Contractor under this contract; and

(3) The agreed price for, or the proceeds of sale of, materials, supplies, or other things acquired by the Contractor or sold under the provisions of this clause and not recovered by or credited to the Government.

(l) If the termination is partial, the Contractor may file a proposal with the Contracting Officer for an equitable adjustment of the price(s) of the continued portion of the contract. The Contracting Officer shall make any equitable adjustment agreed upon. Any proposal by the Contractor for an equitable adjustment under this clause shall be requested within 90 days from the effective date of termination unless extended in writing by the Contracting Officer.

(m) (1) The Government may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the contract, if the Contracting Officer believes the total of these payments will not exceed the amount to which the Contractor will be entitled.

(2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Government upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Contracting Officer because of the circumstances.

(n) Unless otherwise provided in this contract or by statute, the Contractor shall maintain all records and documents relating to the terminated portion of this contract for 3 years after final settlement. This includes all books and other evidence bearing on the Contractor's costs and expenses under this contract. The Contractor shall make these records and documents available to the Government, at the Contractor's office, at all reasonable times, without any direct charge. If approved by the Contracting Officer, photographs, microphotographs, or other authentic reproductions may be maintained instead of original records and documents.

123. *FAR 52.249-10 DEFAULT (FIXED-PRICE CONSTRUCTION) (APR 1984)

(a) If the Contractor refuses or fails to prosecute the work or any separable part, with the diligence that will insure its completion within the time specified in this contract including any extension, or fails to complete the work within this time, the Government may, by written notice to the Contractor, terminate the right to proceed with the work (or the separable part of the work) that has been delayed. In this event, the Government may take over the work and complete it by contract or otherwise, and may take possession of and use any materials, appliances, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the Government resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the Government in completing the work.

(b) The Contractor's right to proceed shall not be terminated nor the Contractor charged with damages under this clause, if-

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include

(i) acts of God or of the public enemy,

Government,

- (ii) acts of the Government in either its sovereign or contractual capacity,
- (iii) acts of another Contractor in the performance of a contract with the
- (iv) fires,
- (v) floods,
- (vi) epidemics,
- (vii) quarantine restrictions,
- (viii) strikes,
- (ix) freight embargoes,
- (x) unusually severe weather, or
- (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within 10 days from the beginning of any delay (unless extended by the Contracting Officer), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, the time for completing the work shall be extended. The findings of the Contracting Officer shall be final and conclusive on the parties, but subject to appeal under the Disputes clause.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been issued for the convenience of the Government.

(d) The rights and remedies of the Government in this clause are in addition to any other rights and remedies provided by law or under this contract.

124. ENVIRONMENTAL LITIGATION (1974 NOV OCE)

(a) If the performance of all or any part of the work is suspended, delayed, or interrupted due to an order of a court of competent jurisdiction as a result of environmental litigation, as defined below, the Contracting Officer, at the request of the Contractor, shall determine whether the order is due in any part to the acts or omissions of the Contractor or a Subcontractor at any tier not required by the terms of this contract. If it is determined that the order is not due in any part to acts or omissions of the Contractor or a Subcontractor at any tier other than as required by the terms of this contract, such suspension, delay, or interruption shall be considered as if ordered by the Contracting Officer in the administration of this contract under the terms of the "Suspension of Work" clause of this contract. The period of such suspension, delay, or interruption shall be considered unreasonable, and an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) as provided in that clause, subject to all the provisions thereof.

(b) The term "environmental litigation," as used herein, means a lawsuit alleging that the work will have an adverse effect on the environment or that the Government has not duly considered, either substantively or procedurally, the effect of the work on the environment.

125. EFARS 52.249-5000 BASIS FOR SETTLEMENT OF PROPOSALS

Actual costs will be used to determine equipment cost for a settlement proposal submitted on the total cost basis under FAR 49.206-2(b). In evaluating a termination settlement proposal using the total cost basis, the following principles will be applied to determine allowable equipment costs:

(1) Actual costs for each piece of equipment, or groups of similar serial or series equipment, need not be available in the contractor's accounting records to determine total actual equipment costs.

(2) If equipment costs have been allocated to a contract using predetermined rates, those charges will be adjusted to actual costs.

(3) Recorded job costs adjusted for unallowable and unallocable expenses will be used to determine equipment operating expenses.

(4) Ownership costs (depreciation) will be determined using the contractor's depreciation schedule (subject to the provisions of FAR 31.205-11).

(5) License, taxes, storage and insurance costs are normally recovered as an indirect expense and unless the contractor charges these costs directly to contracts, they will be recovered through the indirect expense rate.

126. INAPPLICABLE PROVISIONS AND CLAUSES (Local Provision). [Applicable only for projects or delivery orders less than \$100,000]

This provision applies only to delivery orders and projects less than \$100,000.

Pursuant to Pub. L. 103-355, the following provisions and clauses, as noted below, are inapplicable to this contract:

- (a) FAR 28.102-3, Miller Act requirements;
- (b) Not Used;
- (c) FAR 52.203-5, Covenant Against Contingent Fees;
- (d) FAR 52.203-6, Restrictions on Subcontractor Sales to the Government;
- (e) FAR 52.203-7, Anti-Kickback Procedures;
- (f) FAR 52.222-4, Contract Work Hours and Safety Standards Act-Overtime Compensation; and
- (g) FAR 52.223-6, Drug-Free Workplace, except for individuals.

DOCUMENT TABLE OF CONTENTS

DIVISION 00 - DOCUMENTS

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS

5/00, Rev 9/01

PART 1 GENERAL

- 1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)
 - 1.1.1 Start Work
- 1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)
- 1.3 SCOPE OF WORK
 - 1.3.1 Work to Be Done
 - 1.3.2 Location
 - 1.3.3 Contractor Inspections
 - 1.3.4 Principle Features
- 1.4 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES
- 1.5 COMPUTING COMPLETION DATES FOR NON-WORK PERIOD (NOT USED)
- 1.6 CONTRACT DRAWINGS AND SPECIFICATIONS
 - 1.6.1 SETS FURNISHED
 - 1.6.2 NOTIFICATION OF DISCREPANCIES
 - 1.6.3 OMISSIONS
- 1.7 SUBMITTALS
- 1.8 PHYSICAL DATA (APR 1984)
- 1.9 PAYMENT
 - 1.9.1 PROMPT PAYMENT ACT
 - 1.9.2 PAYMENTS FOR MODIFICATIONS
 - 1.9.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)
- 1.10 AVAILABILITY OF UTILITY SERVICES
- 1.11 UTILITY SERVICE INTERRUPTIONS
 - 1.11.1 Outages
 - 1.11.1.1 Procedure
- 1.12 DIGGING PERMITS AND ROAD CLOSINGS
 - 1.12.1 Excavation
 - 1.12.2 Road Closings
- 1.13 DISPOSAL OF CONSTRUCTION DEBRIS
- 1.14 CONSTRUCTION/SITE MANAGEMENT STANDARDS
- 1.15 CONTRACTOR'S TEMPORARY FACILITIES
 - 1.15.1 Plans
 - 1.15.2 Administrative Field Offices and Material Storage Trailers
 - 1.15.3 Material Storage Area
 - 1.15.4 Dumpsters
 - 1.15.5 Portable Sanitation Facilities within MFH Areas
 - 1.15.6 Construction and Safety Fence
 - 1.15.7 Grass Cutting
- 1.16 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER
- 1.17 INSURANCE REQUIRED
- 1.18 SECURITY REQUIREMENTS (SEE SECTION 01501 GRAND FORKS AFB SECURITY REQUIREMENTS)
- 1.19 CONTRACTOR QUALITY CONTROL (CQC)
- 1.20 NONDOMESTIC CONSTRUCTION MATERIALS
- 1.21 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

- 1.22 DAILY WORK SCHEDULES
- 1.23 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)
- 1.24 AS-BUILT DRAWINGS
- 1.25 PROTOTYPE UNITS
- 1.26 CONTRACTOR FURNISHED EQUIPMENT DATA
- 1.27 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS (NOT USED)
- 1.28 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)
- 1.29 ASBESTOS AND LEAD
- 1.30 PROFIT
- 1.31 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES
- 1.32 WAGE RATE APPLICATION
 - 1.32.1 Residential Schedule
 - 1.32.2 Heavy Schedule
- 1.33 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)
- 1.34 FEDERAL HOLIDAYS
- 1.35 WORKING HOURS

PART 2 NOT USED

PART 3 NOT USED

-- End of Document Table of Contents --

SECTION 00800

SPECIAL CONTRACT REQUIREMENTS
5/00, Rev 9/01

PART 1 GENERAL

Attachments:

General Wage Decision Nos. ND020011 (Residential), ND010014 (Heavy)

1.1 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall commence work under this contract within ten (10) calendar days after the date of receipt by him of Notice to Proceed, prosecute said work diligently, and complete the entire work except seeding ready for use not later than 540 calendar days after receipt of Notice to Proceed. The time stated for completion shall include final cleanup of the premises. (FAR 52.211-10)

1.1.1 Start Work

Evidence that the Contractor has started procurement of materials, preparation and submission of shop drawings, preparation of subcontracts, and other preparatory work will satisfy the requirement that work commence within ten (10) calendar days after receipt of Notice to Proceed. Therefore, work need not be commenced at the construction site within ten (10) calendar days.

1.2 LIQUIDATED DAMAGES-CONSTRUCTION (SEPT 2000)

(a) If the Contractor fails to complete the work within the time specified in the contract, the Contractor shall pay liquidated damages to the Government in the amount of \$800.00 each calendar day of delay until the work is completed or accepted.

(b) If the Government terminates the Contractor's right to proceed, liquidated damages will continue to accrue until the work is completed. These liquidated damages are in addition to excess costs of repurchase under the Termination clause. (FAR 52.211-12)

1.3 SCOPE OF WORK

1.3.1 Work to Be Done

The work consists of furnishing all plant, labor, equipment and materials to perform all selective demolition and new construction work in strict accordance with plans, specifications and terms of the contract.

1.3.2 Location

The primary site of work encompasses the renovation of 30 existing family units in 15 buildings, and associated facilities located on I Street, Grand Forks AFB, North Dakota.

The following 8 buildings (16) dwelling units are one story high with

existing concrete basement foundation walls and load bearing first floor wood frame construction.

1887A and 1887B "I" Street	(2) two bedroom renovated family units.
1891A and 1891B "I" Street	(2) two bedroom renovated family units.
1893A and 1893B "I" Street	(2) two bedroom renovated family units.
1899A and 1899B "I" Street	(2) two bedroom renovated family units.
1905A and 1905B "I" Street	(2) two bedroom renovated family units.
1909A and 1909B "I" Street	(2) two bedroom renovated family units.
1911A and 1911B "I" Street	(2) two bedroom renovated family units.

The following 7 buildings (14) dwelling units are two stories high with existing concrete basement foundation walls and load bearing first and second floor wood frame construction.

1883A and 1883B "I" Street	(2) two bedroom renovated family units.
1889A and 1889B "I" Street	(2) two bedroom renovated family units.
1895A and 1895B "I" Street	(2) two bedroom renovated family units.
1897A and 1897B "I" Street	(2) two bedroom renovated family units.
1901A and 1901B "I" Street	(2) two bedroom renovated family units.
1907A and 1907B "I" Street	(2) two bedroom renovated family units.
1913A and 1913B "I" Street	(2) two bedroom renovated family units.

1.3.3 Contractor Inspections

Before beginning work at the site where possible and throughout the course of the work, Contractor or his representative must inspect and verify the location and condition of every item affected by the work under this contract, and report discrepancies to the Contracting Officer. The Contractor shall be responsible to perform such work in accordance with the contract documents at no additional cost to the Government.

1.3.4 Principle Features

The work to be performed at the site includes but is not limited to the following:

Except as specified otherwise; Contractor shall employ applicable industry standards and methods for the removal of existing building structures as shown on drawings, all built-in construction materials and equipment attached to or part of such construction and subsequent disposal of materials and equipment as noted on the drawings or otherwise specified to be removed.

Provide exterior improvements demolition work.

- Provide interior selective demolition work.
- Provide exterior earthwork and trenching for utilities.
- Provide exterior paving work for sidewalks, trash pads and rear patios.
- Provide exterior site improvements work for trash and privacy screens.
- Provide exterior seeding, sod and landscaping work.
- Provide cast in place concrete work for front and rear stairs.
- Provide masonry and mortar work for infilling of basement windows.
- Provide metal fabrications for front and rear porch handrails and guardrails.
- Provide exterior and interior rough carpentry framing work.
- Provide exterior and interior finish carpentry work.

- Provide interior insulation work at exterior walls, attic ceiling and garage ceiling.
- Provide exterior soffit, fascia, gutter and downspout work.
- Provide exterior flashing and sheet metal work.
- Provide exterior and interior joint sealer work.
- Provide exterior garage doors and garage to dwelling unit entry doors.
- Provide interior hollow core wood doors and frames.
- Provide vinyl egress windows in basements.
- Provide finish hardware on all doors and frames.
- Provide interior gypsum drywall, taping, sanding and accessory work.
- Provide interior resilient flooring and accessory work.
- Provide interior carpeting and accessory work.
- Provide exterior and interior painting work.
- Provide delivery and installation of owner supplied existing appliances.
- Provide new appliances.
- Provide kitchen base cabinets, wall cabinets and countertops.
- Provide interior window coverings on windows and patio doors.
- Provide existing interior mechanical demolition work.
- Provide new interior mechanical renovation work
- Provide existing interior plumbing demolition work.
- Provide new interior plumbing renovation work.
- Provide existing interior electrical work.
- Provide new interior electrical work.
- Provide new underground electrical service from new pad-mounted transformers to the rear of each dwelling unit.

The above outline of principle features does not in any way limit the responsibility of the contractor to perform all work and furnish all plant, labor, equipment and materials required by the specifications and contract drawings. In addition to other safety codes and manuals referenced in the contract documents, all work shall be performed in accordance with applicable Occupational Safety and Health Administration (OSHA) regulations and industry accepted safe practices.

1.4 EXCEPTION TO COMPLETION TIME AND LIQUIDATED DAMAGES

In case the Contracting Officer determines that seeding, sodding, and/or planting and/or the specified maintenance thereof is not feasible during the construction period, such work will be excepted from the completion time and liquidated damages. This work shall be accomplished during the first seeding, sodding, and/or planting period and the specified maintenance period following the completion date.

1.5 COMPUTING COMPLETION DATES FOR NON-WORK PERIOD (NOT USED)

1.6 CONTRACT DRAWINGS AND SPECIFICATIONS

1.6.1 SETS FURNISHED

The contractor shall be responsible for making copies of specifications including amendments. The bid drawings as amended shall be utilized in the performance of the work until contract drawings (i.e., bid drawings that have been posted with all amendment changes) are mailed to the Contractor. See Section 01040 As-Built Drawings for drawings being furnished to the

Contractor. The work shall conform to the contract drawings, set out in the drawing index, all of which form a part of these specifications. The work shall also conform to the standard details bound or referenced herein.

1.6.2 NOTIFICATION OF DISCREPANCIES

The Contractor shall check all drawings furnished him immediately upon their receipt and shall promptly notify the Contracting Officer of any discrepancies. Dimensions marked on drawings shall be followed in lieu of scale measurements. Enlarged plans and details shall govern where the same work is shown at smaller scales. All scales shown are based on a standard drawing size of 28" x 40" . If any other size drawings are furnished or plotted the contractor shall adjust the scales accordingly. The contractor shall also advise his sub-contractors of the above. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby.

1.6.3 OMISSIONS

Omissions from the drawings or specifications or the misdescription of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of the work but they shall be performed as if fully and correctly set forth and described in the drawings and specifications.

1.7 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Site Plan; G-RE

Site Plan for temporary facilities layout.

Dirt and Dust Control Plan; G-RE

SD-04 Sample

Prototype Units; G-RE

Prototype family unit shall be constructed to demonstrate construction details and quality of construction and materials. Prototype units will be approved by the Resident Engineer by site inspection.

1.8 PHYSICAL DATA (APR 1984)

Data and information furnished or referred to below is for the Contractors' information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

- a. The indications of physical conditions on the drawings and in

the specifications are the result of site investigations by surveys.

b. Weather conditions shall have been investigated by the Contractor to satisfy himself as to the hazards likely to arise therefrom. Complete weather records and reports may be obtained from the local U.S. Weather Bureau.

c. Transportation facilities shall have been investigated by the Contractor to satisfy himself as to the existence of access highways and railroad facilities. (FAR 52.236-4)

1.9 PAYMENT

1.9.1 PROMPT PAYMENT ACT

Pay requests authorized in CONTRACT CLAUSES clause: "Payments Under Fixed-Price Construction Contracts", will be paid pursuant to the clause, "Prompt Payment for Construction Contracts". Pay requests will be submitted on ENG Form 93 and 93a, "Payment Estimate-Contract Performance" and "Continuation". All information and substantiation required by the identified contract clauses will be submitted with the ENG Form 93, and the required certification will be included on the last page of the ENG Form 93a, signed by an authorized contractor official and dated when signed. The designated billing office is the Office of the Area Engineer.

1.9.2 PAYMENTS FOR MODIFICATIONS

Payments may be made for cost bearing change orders within the scope of the contract only to the extent funds are authorized in the order on a two-part modification. Contractor pricing proposed must be submitted at the earliest possible time after the change order is issued, or at a specific time as directed by the Contracting Officer. At the discretion of the Contracting Officer, any and all payments may be withheld on the modification until the Contractor has submitted a qualifying price proposal, in as much detail as required by the Contracting Officer, and the final price has been agreed.

1.9.3 PAYMENT FOR MATERIALS DELIVERED OFFSITE (MAR 1995)

a. Pursuant to FAR clause 52.232-5, Payments Under Fixed Priced Construction Contracts, materials delivered to the contractor at locations other than the site of the work may be taken into consideration in making payments if included in payment estimates and if all the conditions of the General Provisions are fulfilled. Payment for items delivered to locations other than the work site will be limited to: (1) materials required by the technical provisions; or (2) materials that have been fabricated to the point where they are identifiable to an item of work required under this contract.

b. Such payment will be made only after receipt of paid or receipted invoices or invoices with canceled check showing title to the items in the prime contractor and including the value of material and labor incorporated into the item. Payment for materials delivered off-site includes petroleum products. (List additional items for which payments will be made for off-site delivery.) (EFAR 52.232-5000)

1.10 AVAILABILITY OF UTILITY SERVICES

All reasonably required amounts of domestic water and electricity will be

made available to the Contractor by the Government from existing system outlets and supplies. The Contractor shall, at his own expense, make all temporary connections and install distribution lines. The Contractor shall furnish to the Contracting Officer a complete system layout drawing showing type of materials to be used and method of installation for all temporary electrical systems. The Contractor shall make arrangements with the Using Service, through the Contracting Officer, as to the method of determining the amount of water and electricity to be used by him and the method of payment therefor. All temporary lines shall be maintained by the Contractor in a workmanlike manner satisfactory to the Contracting Officer and shall be removed by the Contractor in like manner prior to final acceptance of the construction. Normal quantities of electricity and water used to make final tests of completely installed systems will be furnished by the Government.

1.11 UTILITY SERVICE INTERRUPTIONS

The Contractor shall submit written notification to the Contracting Officer and Base Utility Superintendent not less than 10 calendar days in advance of each interruption of each utility and communication service to or within existing buildings and facilities being used by others.

1.11.1 Outages

Work shall be planned so that outages will interfere as little as possible with base operations. Wherever possible, portions of the work that can be accomplished without an outage will be done prior to outages. No single outage will exceed 4 hours unless approved in writing. The time and duration of all outages will be coordinated and approved with the Using Agency by the Contracting Officer. All materials, equipment, and labor required during an outage shall be on hand before service is interrupted. Whenever outages occur on weekends, holidays or after normal duty hours the Contractor shall perform the work at such times as designated at no additional cost to the Government. The Contractor shall make his outage request on copies of the form "Request to Base Civil Engineering for Utility Service Interruption at Grand Forks AFB, ND". These forms are available at Base Civil Engineering, Building 410.

1.11.1.1 Procedure

Control of the base electrical system is the responsibility of the Base Utility Superintendent. The Base Utility Superintendent or his authorized representative must approve all switching of electrical equipment/circuits.

Work on de-energized high voltage lines or equipment is not permitted until the Base Utility Superintendent or his authorized representative has issued a safe clearance procedure to the Contractor Foreman in accordance with AFI 32 -1064, Mar 94

1.12 DIGGING PERMITS AND ROAD CLOSINGS

1.12.1 Excavation

Prior to any excavation, the Contractor shall obtain an approved Base Civil Engineering Work Clearance Request. Contractor should allow up to fourteen (14) calendar days for Base Civil Engineering Work Clearance Request to be completed. Base Civil Engineering Work Clearance Request must be approved by the Chief of Operations, at Base Civil Engineering. Existing utility lines to remain, both Government-owned and leased, shall be protected from damage during excavation and backfilling. If damaged, lines shall be

repaired in a timely manner by the Contractor at no expense to the Government. Mechanical digging shall not commence, within 5 ft of buried utility lines, until locations of those lines have been established and properly verified by hand digging. A minimum of 48 hours time should be allowed for agency response to Contractor requests for identifying and marking buried utility line routes.

1.12.2 Road Closings

Roads shall only be closed one lane at a time and vehicular traffic shall be allowed to pass through the construction area. Work on or near roadways shall be flagged in accordance with the safety requirements in Safety and Health Requirements Manual EM 385-1-1, which forms a part of these specifications. Work located along the alert force route shall not cause blockage and the Contractor shall maintain unobstructed access for alert force traffic at all times.

1.13 DISPOSAL OF CONSTRUCTION DEBRIS

All concrete from sidewalks and concrete stairs and all other debris and excess construction material shall be disposed of off base by the Contractor at no additional cost to the Government. All sediment shall be disposed off-base in an environmentally sound manner by the Contractor and proof of proper disposal shall be furnished by the Contractor to the Contracting Officer representative upon request. Disposal of construction debris must comply with North Dakota solid waste laws. See Section 01000, paragraph 15.6.2 for additional information regarding waste disposal.

1.14 CONSTRUCTION/SITE MANAGEMENT STANDARDS

For most construction projects, the Contracting Officer (CO) will provide the contractor with two sites, the primary construction site and a supplemental storage site. The supplemental storage site may not be in close proximity of the construction site but at a site designated by the CO out of view from the general public. The primary site is the construction site.

A visually acceptable site at Grand Forks Air Force Base is an important construction standard. Contractor's trailers and storage buildings must follow the base paint standards; therefore they are to be antique linen in color. The contractor shall maintain the trailers and storage buildings in good condition or must remove them. The contractor is responsible for the security of his property and general housekeeping of the area(s).

1.15 CONTRACTOR'S TEMPORARY FACILITIES

1.15.1 Plans

a. Site Plan: Prior to starting the work, the contractor shall submit site plans to the Contracting Officer for approval showing the layout and details of all temporary facilities used for this contract. The base approval authority, normally the Base Civil Engineer, must approve the plan. The plan shall include the location of the safety and construction fences, location of all site trailers, equipment and material storage areas, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas. Site photographs prior to the start of work may be included with the plan. At completion of work, the contractor shall remove the facilities and restore the site to the

original condition.

a. Dirt and Dust Control Plan: The contractor shall submit truck and material haul routes along with a plan for controlling dirt, debris, and dust on base roadways. As a minimum, the plan shall identify the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways

1.15.2 Administrative Field Offices and Material Storage Trailers

: Contractor's administrative field office and storage trailers shall be in like new condition and the exterior must be the base standard color (antique linen). Locate the office and trailers behind the construction fence unless otherwise indicated on the drawings. Storage of material/debris under the trailers is prohibited.

1.15.3 Material Storage Area

a. Supplemental Storage Area: This area is for storage of items not immediately required at the construction site. The contractor is responsible for the security of the stored property and general housekeeping.

b. Primary Storage Area: Site storage is limited to the materials that are needed within one week. Enclose the storage area by a construction fence, as described later.

1.15.4 Dumpsters

Equip dumpsters with a secure cover and paint the standard base color (tobacco brown). The cover shall be closed at all times, except when being loaded with trash and debris. Locate dumpsters inside the construction fence and out of the public view. Empty site dumpsters at least once a week, or as needed to keep the site free of debris and trash. If necessary, provide 218-liter (55 gallon) trash containers painted the darker base color to collect debris in the construct site area. Locate the trash containers inside the construction fence and out of the public view. Empty trash containers at least once a day. Large demolition normally requires a large dumpster without lids-these are acceptable but should not have debris higher than the sides before emptying.

1.15.5 Portable Sanitation Facilities within MFH Areas

Each portable toilet in the MFH area shall have a combination lock; the lock shall be secured when the portable toilet is not in use. All temporary sewer and sanitation facilities shall be self-contained units with both urinals and stool capabilities. Ventilate the units to control odors and fumes and empty and clean them at least once a week or more often if required by the Contracting Officer. The doors should be self-closing. The exterior of the unit will match the base standard (antique linen), unless the facility is behind the construction fence or out of the public view.

1.15.6 Construction and Safety Fence

The contractor shall also provide a temporary safety fence with gates and warning signs at the construction site prior to the start of work to protect the public from construction activities. The safety fence will

enclose the project site. The safety fence will match the base standard (tobacco brown) (or bright orange where it protects excavated areas), high density polyethylene grid or approved equal, a minimum of 42 inches high, supported and tightly secured to steel posts located on minimum 10 foot centers. The contractor must remove the fence from the work site upon completion of the contract.

1.15.7 Grass Cutting

Cut grass (or annual weeds) within the construction and storage sites to a 4 inch height at least once a week during the growing season unless the grass area is not visible to the public. Trim the grass around the fences at time of grass cutting. Grass or weeds on stockpiled earth shall be maintained as described above.

1.16 TIME EXTENSIONS FOR UNUSUALLY SEVERE WEATHER

a. This clause specifies the procedure for the determination of time extensions for unusually severe weather in accordance with the contract clause entitled "Default: (Fixed-Price Construction)." In order for the Contracting Officer to award a time extension under this clause, the following conditions must be satisfied:

(1) The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.

(2) The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

b. The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

MONTHLY ANTICIPATED ADVERSE WEATHER DELAY WORK DAYS BASED ON (5) DAY WORK WEEK

Jan (*)	Feb (*)	Mar (16)	Apr (03)	May (05)	Jun (06)
Jul (06)	Aug (05)	Sep (04)	Oct (03)	Nov (13)	Dec (*)

* Anticipate losing entire month to adverse weather.

c. Upon acknowledgment of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record on the daily CQC report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical activities for 50 percent or more of the contractor's scheduled work day. The number of actual adverse weather delay days shall include days impacted by actual adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month, and be recorded as full days. If the number of

actual adverse weather delay days exceeds the number of days anticipated in paragraph b. above, the contracting officer will convert any qualifying delays to calendar days, giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the contract clause entitled "Default (Fixed Price Construction)". (ER 415-1-15)

1.17 INSURANCE REQUIRED

In accordance with CONTRACT CLAUSES clause: "Insurance Work on a Government Installation," the Contractor shall procure the following minimum insurance:

Type	Amount
Workmen's Compensation and Employer's Liability Insurance	\$100,000
General Liability Insurance	\$500,000 per occurrence
Automobile Liability Insurance	
Bodily injury	\$200,000 per person and \$500,000 per occurrence
Property damage	\$ 20,000 per occurrence

(Coverages per FAR 28.307-2)

1.18 SECURITY REQUIREMENTS (SEE SECTION 01501 GRAND FORKS AFB SECURITY REQUIREMENTS)

1.19 CONTRACTOR QUALITY CONTROL (CQC)

See Section 01451 Contractor Quality Control.

1.20 NONDOMESTIC CONSTRUCTION MATERIALS

The List of nondomestic construction materials or their components included in the list set forth in paragraph 25.104 of the Federal Acquisition Regulation does not apply to the requirements of the contract clause entitled "Buy American Act Construction Materials".

1.21 NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE (SEP 1990)

Any contract awarded as a result of this solicitation will be a [DX rated order] [DO rated order] certified for national defense use under the Defense Priorities and Allocations System (DPAS) (15 CFR 700), and the Contractor will be required to follow all of the requirements of this regulation. (FAR 52.211-14)

1.22 DAILY WORK SCHEDULES

In order to closely coordinate work under this contract, the Contractor shall prepare a written agenda/meeting minutes and attend a weekly coordination meeting with the Contracting Officer and Using Service at which time the Contractor shall submit for coordination and approval, his proposed daily work schedule for the next two week period. The Contractor shall provide a copy of modifications (MODs), Serial Letters, Requests for Information (RFIs) and any other information that is needed in the minutes of the meeting. Required temporary utility services, time and duration of interruptions, and protection of adjoining areas shall be included with the Contractor's proposed 2-week work schedule. At this meeting, the

Contractor shall also submit his schedule of proposed dates and times of all preparatory inspections to be performed during the next 2 weeks. The items of work listed on the proposed 2-week schedule are to be keyed to the NAS by activity number and description for each activity anticipated to be performed during the next 2-week period. Coordination action by the Contracting Officer relative to these schedules will be accomplished during these weekly meetings. Daily reports shall be completed and given to the Contracting Officer or Representative within 24 hours of work

1.23 EQUIPMENT OWNERSHIP AND OPERATING EXPENSE SCHEDULE (MAR 1995)

a. This statement shall become operative only for negotiated contracts where cost or pricing data is requested, and for modifications to sealed bid or negotiated contracts where cost or pricing data is requested. This clause does not apply to terminations. See 52.249-5000, Basis for settlement of proposals and FAR Part 49.

b. Allowable cost for construction and marine plant and equipment in sound workable condition owned or controlled and furnished by a Contractor or subcontractor at any tier shall be based on actual cost data for each piece of equipment or groups of similar serial and series for which the Government can determine both ownership and operating costs from the Contractor's accounting records. When both ownership and operating costs cannot be determined for any piece of equipment or groups of similar serial or series of equipment from the Contractor's accounting records, costs for that equipment shall be based upon the applicable provisions of EP 1110-1-8, "Construction Equipment Ownership and Operating Expense

Schedule," Region IV. Copies of each regional schedule may be obtained through the following internet site:
<http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep.htm>. Working conditions shall be considered to be average for determining equipment rates using the schedule unless specified otherwise by the Contracting Officer. For equipment not included in the schedule, rates for comparable pieces of equipment may be developed using the formula provided in the schedule. For forward pricing, the Schedule in effect at the time of negotiations shall apply. For retrospective pricing, the Schedule in effect at the time the work was performed shall apply.

c. Equipment rental costs are allowable, subject to the provisions of FAR 31.105(d)(ii) and FAR 31.205-36. Rates for equipment rented from an organization under common control, lease-purchase arrangements, and sale-leaseback arrangements will be determined using the schedule, except that actual rates will be used for equipment leased from an organization under common control that has an established practice of leasing the same or similar equipment to unaffiliated lessees.

c. When actual equipment costs are proposed and the total amount of the pricing action exceeds the small purchase threshold, the contracting officer shall request the contractor to submit either certified cost or pricing data, or partial/limited data as appropriate. The data shall be submitted on Standard Form 1411, Contract Pricing Proposal Cover Sheet. (EFARS 52.231-5000)

1.24 AS-BUILT DRAWINGS

See SECTION 01040 - AS-BUILT DRAWINGS

1.25 PROTOTYPE UNITS

After contract award, a prototype family unit shall be constructed to demonstrate construction details, and quality of construction. Each stage of work shall be completed on the prototype family unit prior to starting work on the same stage for similar buildings in the project. The prototype family unit will be used to verify the details of the approved design and materials selections and to establish the standards of construction and workmanship against which the remaining project will be judged. Work on each successive stage of the prototype family unit may begin immediately after the approval of the preceding stage. However, a representative sample of the work of each stage of the construction shall be retained for examination within the prototype family unit (i.e., not worked over, covered, concealed in any way) until completion of that stage of the work throughout the project unless otherwise authorized by the Contracting Officer. As a minimum, the stages of work in the prototype family unit which shall be subject to approval by the Contracting Officer shall include the following:

- Concrete work
- Rough framing (walls and partitions)
- Plumbing, mechanical, electrical rough-in
- Insulation (walls, ceilings or roofs)
- Drywall installation
- Drywall finishing
- Doors
- Infiltration compliance
- Installation and operation of fixtures and equipment (plumbing, mechanical, and electrical)
- Finish carpentry and cabinetry
- Interior finishes and trim

1.26 CONTRACTOR FURNISHED EQUIPMENT DATA

See Section 01200 Warranty of Construction for Contractor Furnished Equipment Data to be submitted as part of the Warranty Equipment Booklet.

1.27 ACCOMMODATIONS FOR GOVERNMENT INSPECTORS (NOT USED)

1.28 PERFORMANCE OF WORK BY CONTRACTOR (APR 1984)

The Contractor shall perform on the site, and with its own organization, work equivalent to at least [twenty (20) percent] of the total amount of work to be performed under the contract. This percentage may be reduced by a supplemental agreement to this contract if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the Government. (FAR 52.236-1)

1.29 ASBESTOS AND LEAD

a. The Contractor is warned that inhalation of asbestos and lead has been associated with health hazards.

b. Asbestos-containing materials have been identified in area(s) where contract work is to be performed. All contract work activities where the potential exists for worker exposure to airborne asbestos fibers shall be performed in accordance with the requirements set forth in SECTION 02060 ASBESTOS CONTAINING MATERIAL (ACM) REMOVAL AND DISPOSAL and the ASBESTOS AND

LEAD PAINT INSPECTION REPORT

c. Lead has been determined to be present in some painted surfaces which are scheduled for removal/renovation. See SECTION 01400 SPECIAL SAFETY PROCEDURES, SECTION 02061 LEAD-BASED PAINT (LBP) REMOVAL AND DISPOSAL and ASBESTOS AND LEAD PAINT INSPECTION REPORT for locations and proper procedures.

1.30 PROFIT

a. Weighted guidelines method of determining profit shall be used on any equitable adjustment change order or modification issued under this contract. The profit factors shall be as follows:

Factor	Rate	Weight	Value
Degree of Risk	20		
Relative difficulty of work	15		
Size of Job	15		
Period of performance	15		
Contractor's investment	5		
Assistance by Government	5		
Subcontracting	25		
	100		

b. Based on the circumstances of each procurement action, each of the above factors shall be weighted from .03 to .12 as indicated below. The value shall be obtained by multiplying the rate by the weight. The value column when totalled indicates the fair and reasonable profit percentage under the circumstances of the particular procurement.

(1) Degree of Risk. Where the work involves no risk or the degree of risk is very small, the weighting should be .03; as the degree of risk increases, the weighting should be increased up to a maximum of .12. Lump sum items will have, generally, a higher weighted value than the unit price items for which quantities are provided. Other things to consider: the portion of the work to be done by subcontractors, nature of work, where work is to be performed, reasonableness of negotiated costs, amount of labor included in costs, and whether the negotiation is before or after performance of work.

(2) Relative Difficulty of Work. If the work is most difficult and complex, the weighting should be .12 and should be proportionately reduced to .03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider: the nature of the work, by whom it is to be done, where, and what is the time schedule.

(3) Size of Job. All work not in excess of \$100,000 shall be weighted at .12. Work estimated between \$100,000 and \$5,000,000 shall be proportionately weighted from .12 to .05.

(4) Periods of Performance. Jobs in excess of 24 months are to be weighted at .12. Jobs of lesser duration are to be proportionately weighted to a minimum of .03 for jobs not to exceed 30 days. No weight

where additional time not required.

(5) Contractor's Investment. To be weighted from .03 to .12 on the basis of below average, average, and above average. Things to consider: amount of subcontracting, mobilization payment item, Government furnished property, equipment and facilities, and expediting assistance.

(6) Assistance by Government. To be weighted from .12 to .03 on the basis of average to above average. Things to consider: use of Government-owned property, equipment and facilities, and expediting assistance.

(7) Subcontracting. To be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be .03 and such weighting proportionately increased to .12 where all the work is performed by the Contractor's own forces.

1.31 LABOR CONDITIONS APPLICABLE TO TEMPORARY FACILITIES

It is the position of the Department of Defense that the Davis-Bacon Act, 40 U.S.C. 276a is applicable to temporary facilities such as batch plants, sandpits, rock quarries, and similar operations, located off the immediate site of the construction but set up exclusively to furnish required materials for a construction project on the site of the work. Clause "Payrolls and Basic Records" of the CONTRACT CLAUSES is applicable to such operations.

1.32 WAGE RATE APPLICATION

1.32.1 Residential Schedule

Applicable to all work required within 5 feet outside the building lines.

1.32.2 Heavy Schedule

Applicable to all work required beyond 5 feet outside the building.

1.33 (FAR 52.222-23) NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for Minority Participation
for Each Trade

Goals for Female Participation
for Each Trade

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs Office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the -

- (1) Name, address, and telephone number of the subcontractor;
- (2) Employer identification number of the subcontractor;
- (3) Estimated dollar amount of the subcontract;
- (4) Estimated starting and completion dates of the subcontract; and
- (5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is Grand Forks SMSA-2985, Grand Forks Co. a part of.

1.34 FEDERAL HOLIDAYS

The following Federal legal holidays are observed by this installation:

New Year's Day	1 January
Martin Luther King's Birthday	Third Monday in January
President's Day	Third Monday in February
Memorial Day	Last Monday in May
Independence Day	4 July
Labor Day	First Monday in September
Columbus Day	Second Monday in October
Veterans Day	11 November
Thanksgiving Day	Fourth Thursday in November
Christmas Day	25 December

If a wage determination applies the number of holidays specified on it, it has priority over this clause.

1.35 WORKING HOURS

Working hours for the Contractor will normally be between the hours of 7:30 a.m. and 4:30 p.m. excluding Saturdays, Sundays, and Federal holidays. If the Contractor desires to work during periods other than above, additional Government inspection forces may be required. The Contractor must make his/her request to the Contracting Officer a minimum of three days in advance of his/her intention to work during periods other than normal duty hours/days. However, if inspectors are required to perform in excess of their normal duty hours/days solely for the benefit of the Contractor, the actual cost of inspection at overtime rates will be charged to the Contractor. These adjustments to the contract price may be made periodically as directed by the Contracting Officer.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

General Decision Number ND010011

General Decision Number ND010011
Superseded General Decision No. ND000011
State: North Dakota
Construction Type:
RESIDENTIAL
County(ies):
BURLEIGH GRAND FORKS MORTON
RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family
homes and apartments up to and including 4 stories)
Modification Number Publication Date
0 03/02/2001
1 04/06/2001
2 05/04/2001
3 09/28/2001
4 01/04/2002

COUNTY(ies):

BURLEIGH GRAND FORKS MORTON
BRND0004B 05/01/2001

	Rates	Fringes
BRICKLAYERS	22.00	4.20

ELEC0714D 07/01/2001

	Rates	Fringes
BURLEIGH AND MORTON COUNTIES: ELECTRICIANS	19.62	6.15+11%

ELEC1426N 01/01/2000

	Rates	Fringes
GRAND FORKS COUNTY: WIREMAN	18.94	4.28+11.5%
CABLE SPLICER	19.89	4.28+11.5%

* SFND0669A 01/01/2002

	Rates	Fringes
SPRINKLER FITTER	23.47	6.05

SUND4004A 04/11/2000

	Rates	Fringes
CARPENTERS(including the installation of form work & cabinets,excluding the installation of Drywall & Batt & Blown Insulation)	10.90	
CEMENT MASONS	9.85	
DRYWALL FINISHERS	13.61	1.06
DRYWALL HANGERS	14.64	
INSULATORS,BATT & BLOWN	8.00	
LABORERS:		
Common	8.39	
Landscape Worker	8.41	
PAINTERS,excluding Drywall Finishing	10.00	
PLUMBERS,including HVAC piping	11.42	
POWER EQUIPMENT OPERATORS:		
Backhoe	18.10	
Loader	18.10	
ROOFERS	8.13	
SHEET METAL WORKERS,HVAC duct only	12.62	

WELDERS - Receive rate prescribed for craft performing operation
to which welding is incidental.

=====

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29 CFR 5.5(a) (1) (v)).

In the listing above, the "SU" designation means that rates
listed under that identifier do not reflect collectively

bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

This page was intentionally left blank for duplex printing.

General Decision Number ND010014

General Decision Number ND010014
Superseded General Decision No. ND000014
State: North Dakota
Construction Type:
HEAVY
County(ies):
BURLEIGH GRAND FORKS
CASS MORTON
HEAVY CONSTRUCTION PROJECTS (Excluding Sewer & Water Line
Construction & Drainage Projects)
Modification Number Publication Date
 0 03/02/2001
 1 09/28/2001

COUNTY(ies):

BURLEIGH GRAND FORKS

CASS MORTON

* ELEC0714I 01/01/2001

	Rates	Fringes
BURLEIGH AND MORTON COUNTIES:		
ELECTRICIANS:		
ELECTRICIAN	23.45	10.5%+a
CABLE SPLICER	23.85	10.5%+a

FOOTNOTE;

a. \$5.20 per hour.

ELEC14260 01/01/2000

	Rates	Fringes
CASS AND GRAND FORKS COUNTIES:		
WIREMAN	18.94	4.28+11.5%
CABLE SPLICER	19.89	4.28+11.5%

SUND2006A 05/04/2000

	Rates	Fringes
LABORERS:		
Common	9.92	
Pipelayers	12.00	
PAINTER:		
Brush, Roller, & Spray	17.00	
POWER EQUIPMENT OPERATORS:		
Backhoe	15.74	4.84
Bobcat	12.60	4.50
Bulldozer	14.41	4.50
Crane	13.29	3.42
Front End Loader	14.93	
Motor Grader	18.10	
Scraper	16.13	
Tractor	12.13	
TRUCK DRIVER:		
Dump	8.50	
Tandem/Semi	15.77	

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.
=====

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29 CFR 5.5(a)(1)(v)).

In the listing above, the "SU" designation means that rates listed under that identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

ND010014-2

09/28/2001

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U. S. Department of Labor
200 Constitution Avenue, N. W.
Washington, D. C. 20210

4.) All decisions by the Administrative Review Board are final.

END OF GENERAL DECISION

09/28/2001

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01040

AS-BUILT DRAWINGS

5/00; Rev 11/01

PART 1 GENERAL

- 1.1 DEFINITIONS
 - 1.1.1 Red-Line Drawings
 - 1.1.2 As-Built Drawings
 - 1.1.3 Vellum Drawings
 - 1.1.4 Black-Line Drawings
 - 1.1.5 Full-Size Drawings
 - 1.1.6 Half-Size Drawings
 - 1.1.7 Modification Circle
 - 1.1.8 Mylar Drawings
 - 1.1.9 Electronic CADD Files
- 1.2 GENERAL REQUIREMENTS
- 1.3 PAYMENT
- 1.4 TRANSMITTAL OF AS-BUILT DRAWINGS
 - 1.4.1 Preliminary As-Built Drawings
 - 1.4.2 Final As-Built Drawings
- 1.5 PROCEDURE
- 1.6 TITLE BLOCKS
- 1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS
- 1.8 WORD ABBREVIATIONS
- 1.9 LEGEND SHEETS
- 1.10 CONTRACTOR SHOP DRAWINGS
- 1.11 INDEXING OF DRAWINGS

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

- 3.1 GENERAL
- 3.2 SITE WORK
 - 3.2.1 Utilities
 - 3.2.2 Structures
 - 3.2.3 Grades
- 3.3 STRUCTURAL
 - 3.3.1 Steel
- 3.4 MECHANICAL
 - 3.4.1 Ductwork
 - 3.4.2 Plumbing
- 3.5 ELECTRICAL
 - 3.5.1 PANELS
 - 3.5.2 Controls

-- End of Section Table of Contents --

SECTION 01040

AS-BUILT DRAWINGS

5/00; Rev 11/01

PART 1 GENERAL

1.1 DEFINITIONS

The definitions listed below form a part of this specification.

1.1.1 Red-Line Drawings

Contract drawings marked-up to show actual work performed to include necessary sketches, modification drawings, shop drawings and notes. Green ink is used to indicate work deleted from the contract. Red ink is used for additions and deviations from the contract.

1.1.2 As-Built Drawings

Professional finished electronic CADD files developed from the original contract drawings that include all of the information from the redline drawings and suitable for half-size reproduction.

1.1.3 Vellum Drawings

Drawings on erasable Vellum 20# similar or equal to Xerox Zero solvent vellum.

1.1.4 Black-Line Drawings

Paper drawings reproduced from mylar drawings and suitable for microfilming.

1.1.5 Full-Size Drawings

28 inches x 40 inches nominal size drawings with all details visually readable.

1.1.6 Half-Size Drawings

14 inches x 20 inches nominal size drawings with all details visually readable.

1.1.7 Modification Circle

A circle with a horizontal line through the center. The top half will contain the letter "P" with the bottom half containing the Modification number. The lettering standard will be 120/6 WRICO or similar.

1.1.8 Mylar Drawings

Drawings on polyester film, 3 or 5 mil, similar or equal to K & E Stabilene.

1.1.9 Electronic CADD Files

Electronic CADD files are files saved on CD-ROM in accordance with

appropriate CADD standard. The CADD standard will include level on/off status, special characters, line wieghts, font, and size requirements.

1.2 GENERAL REQUIREMENTS

The work includes creation of electronic cadd files on AutoCADD (version 14) as-built drawings to accurately depict existing conditions of the project. As-Built Drawings will become the permanent record drawings of the construction. The Contractor is responsible for development of electronic CADD files in accordance with Design Architect-EngineerCADD standards. Design Architect-Engineer's CADD standards will be supplied on Compact Disk (CD) with updated contract award drawings.. The As-Built drawings shall include all major features of the work and all details to the same level as the original contract set of drawings. All changes from the contract drawings, including but not limited to all deviations, additional information, and modifications to the contract. Where contract drawings or specifications allow for options, only the option selected and actually constructed shall be shown on the As-Built Drawings. Systems designed or enhanced by the Contractor such as HVAC control system, fire alarm system fire sprinkler system, irrigation sprinkler system, letters of clarification, shall be accurately and neatly recorded on the As-Built Drawings using the same symbols, terminology, and general quality as the original set of contract drawings. All sheets affected by a change shall be revised. The transmittal requirements for the As-built Drawings shall be shown as events on the Contractor prepared progress chart or network analysis system (NAS), whichever is applicable.

1.3 PAYMENT

In accordance with the clause "Payment Under Fixed - Price Construction Contracts", which provides for progress payments on estimates of work accomplished (which meets the standards of quality established under the contract), \$13,750 will be withheld from payment for the creation of As-Built drawings until the final as-built drawings are delivered to the Contracting Officer (including any necessary revisions and subject to the approval of the Contracting Officer).

1.4 TRANSMITTAL OF AS-BUILT DRAWINGS

1.4.1 Preliminary As-Built Drawings

The Contractor shall produce Preliminary As-Built Drawings indicating as-built conditions on AutoCADD (Version 14.0) with "clouding". Preliminary drawings shall consist of 15% of total project drawings. The As-Built CADD files which include all changes up to the time Preliminary Drawings shall be sent as stated below. The Contractor shall draw attention to all drawing changes by "clouding" the affected area. This "clouding" will be accomplished on layer 63 of the drawing file. The Preliminary Drawings shall consist of one (1) set of CADD files on a CD and one (1) full-size set of the Black-Line Drawings. One (1) set of CADD files on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). One (1) full-size of the Black-Line Drawings shall be submitted to the COR. Both documents shall be submitted three (3) weeks prior to the final acceptance inspection unless otherwise directed by the COR. The COR will notify the Contractor in writing of approval / disapproval. The Contractor shall not submit the Final Drawings until he receives the COR's letter approving the Preliminary Drawings.

1.4.2 Final As-Built Drawings

The Contractor shall produce Final As-Built Drawings on AutoCADD (Version 14.0) without "clouding". The Final Drawings shall include all changes. The Final Drawings shall be submitted to the COR and Omaha District Office (CENWO-ED-DI) no earlier than the day of acceptance of the project and no later than thirty (30) days after the date on the acceptance letter for the Preliminary Drawing unless otherwise directed by the COR. (Note: Final drawings should not be forwarded to the customer. Corps of Engineers, Omaha District COR will forward to the customer after Quality Review.) One (1) set of CADD files on a CD shall be submitted to the Omaha District Office (ATTN: CENWO-ED-DI, Jim Janicek). Send the following documents to the COR: One (1) set of CADD files on CD (folder name containing as-built files shall be designated "AS-BUILTS" on each CD-ROM). Both CD case and CD shall contain the name of the project, location, specification number, and contract number, and words "As-Built Record Set"). The folder shall contain drawings, indexes and X-REF files related to all as-builts. In addition one full-size set red-lined hard copy drawings prepared by the Contractor during construction.

1.5 PROCEDURE

Within 30 days after Notice to Proceed, the Government will furnish the Contractor one full size set of contract drawings on bond paper. One (1) CD containing the contract drawings and CADD standards in AutoCADD (Version 14.0) , format for use in the preparation of As-Built Drawings by the Contractor, will be forwarded to the Resident Engineer. This CD will then be furnished to the Contractor after signed receipt to the Resident Engineer. The Contractor shall create a set of electronic Cadd files and full-size Red-Line Drawings to fully indicate As-Built conditions. The Red-Line Drawings shall be maintained at the site, in a current condition until the completion of the work and shall be available for review by the COR at all times. All as-built conditions shall be on the Red-Line Drawings within two (2) days after the work activity is completed or shall be entered on the deficiency tracking system (see Section 01451A, CONTRACTOR QUALITY CONTROL).

1.6 TITLE BLOCKS

The contract number and the specification number (if available) shall be shown on all sheets. "RECORD DRAWING" shall be added below the title block on all sheets. All modifications to the contract shall be posted in ascending order. The top line of the revision box shall state "REVISED TO SHOW AS-BUILT CONDITIONS" and dated. All modifications to all plans, sections, or details, shall have a modification number placed in the revision box under column entitled "Symbol". The statement "GENERAL REVISIONS" may be used when applicable. The date to be added in the revision box for modifications is found in Block 3 of Form SF-30. Cover Sheet will have Contract Award Set changed to As-Built Record Set with month & year completed. Month and year completed will also go in the date box in the title block. There will be no separate dates.

1.7 PROCEDURES FOR POSTING MODIFICATION CHANGES TO DRAWINGS

Follow directions in the modification for posting descriptive changes.

A Modification Circle shall be place at the location of each deletion.

The highest modification number on the sheet should be shown in

the modification circle in the "DATE" and "DRAWING CODE" boxes of the title block.

For all new details or sections that are added to a drawing, place a Modification Circle by the detail or section title.

For changes to a drawing, place a Modification Circle by the title of the affected plan, section or detail titles (each location).

For changes to schedules on drawings, a Modification Circle shall be placed either by the schedule heading or by the change in the schedule.

The Modification Circle size shall be 1/2-inch diameter unless the area where circle is to be placed is crowded. Use smaller size circle for crowded areas.

1.8 WORD ABBREVIATIONS

Abbreviations shown on the abbreviation sheet shall be used to describe all work items. Additional word abbreviations, not found on the abbreviation sheet but necessary to describe the work, shall be properly identified and incorporated with the other standard word abbreviations.

1.9 LEGEND SHEETS

Symbols, which conflict with those on the original contract legend sheet, shall not be used. Additional symbols, properly identified, necessary to depict any additional work items, shall be added to the legend sheet or supplemental legend. Those projects that do not have legend sheets may use supplemental legends on each sheet where symbol is shown.

1.10 CONTRACTOR SHOP DRAWINGS

Contractor shop drawings, which supersede data on the contract plans and/or additional drawings, prepared by the Contractor, shall be incorporated into the As-Built Drawings. Design plans prepared by Contractor shall include the designer's name on the As-Built Drawings.

1.11 INDEXING OF DRAWINGS

If drawings are added to the portfolio of drawings to depict as-built conditions, the index of drawings shall be revised accordingly.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL

As-Built drawings shall include as-built information to the same level of detail as shown on the original details, unless otherwise specified. The Contractor shall provide any additional full-size drawings as required to display all the details.

3.2 SITE WORK

3.2.1 Utilities

All utilities shall be shown whether active, inactive, shown on the original contract drawings, or found on-site. The type of utility,

location, general direction, size, material make-up and depth shall be shown. The location and description of any utility line or other installations of any kind known to exist within the construction area shall be shown. The location shall include dimensions to permanent features.

3.2.2 Structures

Structures above and below ground shall be shown. The size, material make-up, location, height, and/or depth shall be shown. Manholes shall show rim elevation and invert elevations as applicable. Power poles shall show electrical equipment and voltage rating.

3.2.3 Grades

Grade or alignment of roads, structures, or utilities shall be corrected if any changes were made from the contract drawings. Elevations shall be corrected if changes were made in site grading.

3.3 STRUCTURAL

3.3.1 Steel

Shop drawings that deviate from the contract drawings shall be incorporated in the As-Built Drawings.

3.4 MECHANICAL

3.4.1 Ductwork

Ductwork shall be shown to reflect actual installation and duct size. Ductwork routing changes shall be shown.

3.4.2 Plumbing

Piping and fixtures shall be shown to reflect the type of material, size and the route or location.

3.5 ELECTRICAL

3.5.1 PANELS

All contract drawing panel schedules shall be revised to show as-built conditions. Home-run circuit designation on electrical drawings shall accurately correspond to the as-built panel schedules.

3.5.2 Controls

All control diagrams in contract drawings shall be revised to reflect as-built conditions, and setpoints.

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01200

WARRANTY OF CONSTRUCTION

5/00 (Rev 10/00)

PART 1 GENERAL

- 1.1 WARRANTY OF CONSTRUCTION
- 1.2 ADDITIONAL WARRANTY REQUIREMENTS
 - 1.2.1 Performance Bond
 - 1.2.2 Pre-Warranty Conference
 - 1.2.3 Equipment Warranty Identification
 - 1.2.4 Warranty Service Calls
 - 1.2.5 Equipment Warranty Booklet
- 1.3 SUBMITTALS
- 1.4 EQUIPMENT WARRANTY IDENTIFICATIONS TAGS
 - 1.4.1 GENERAL REQUIREMENTS
 - 1.4.1.1 Tags and Information
 - 1.4.1.2 Tags for Warranted Equipment
 - 1.4.1.3 Exclusion to Providing Tags
 - 1.4.2 EXECUTION
 - 1.4.3 Equipment Warranty Tag Replacement

PART 2 NOT USED

PART 3 NOT USED

-- End of Section Table of Contents --

SECTION 01200

WARRANTY OF CONSTRUCTION
5/00 (Rev 10/00)

PART 1 GENERAL

1.1 WARRANTY OF CONSTRUCTION

(a) Foremost and in addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (i) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, design furnished, or workmanship performed by the Contractor or any subcontractor or supplier at any tier.

(b) This warranty shall continue for a period of 1 year from the date of final acceptance of the work. If the Government takes possession of any part of the work before final acceptance, this warranty shall continue for a period of 1 year from the date the Government takes possession.

(c) The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Government-owned or controlled real or personal property, when that damage is the result of--

(1) The Contractor's failure to conform to contract requirements;
or

(2) Any defect of equipment, material, workmanship, or design furnished by the Contractor.

(d) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause.

(e) The Contractor's warranty with respect to work restored, repaired or replaced will run for 1 year from the date of restoration, repair or replacement. This provision applies equally to all items restored, repaired, or replaced under paragraph (c) and (d) above.

(f) The Government will notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. Repair work necessary to correct a warranty condition which arises to threaten the health or safety of personnel, the physical safety of property or equipment, or which impairs operations, habitability of living spaces, etc., will be performed by the Contractor on an immediate basis as directed verbally by the Government. Written verification will follow verbal instruction.

(g) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of verbal or written notice, the Government shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(h) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall--

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed, in writing, for the benefit of the Government, if directed by the Contracting Officer; and

(3) Enforce all warranties for the benefit of the Government, if directed by the Contracting Officer.

(i) In the event the Contractor's warranty under paragraph (b) of this clause has expired, the Government may bring suit at its expense to enforce a subcontractor's, manufacturer's, or supplier's warranty.

(j) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material or design furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design.

(k) This warranty shall not limit the Government's rights under the Inspection and Acceptance clause of this contract with respect to latent defects, gross mistakes, or fraud.

1.2 ADDITIONAL WARRANTY REQUIREMENTS

1.2.1 Performance Bond

(a) It is understood that the Contractor's Performance Bond will remain effective for one (1) year from the date of acceptance.

(b) If either the Contractor or his representative doesn't diligently pursue warranty work to completion, the contractor and surety will be liable for all costs. The Government, at its option, will either have the work performed by others or require the surety to have it done. Both direct and administrative costs will be reimbursable to the Government.

1.2.2 Pre-Warranty Conference

(a) Prior to contract completion and at a time designated by the Contracting Officer or his authorized representative, the Contractor shall meet with the Contracting Officer or his authorized representative to develop a mutual understanding with respect to the requirements of the Paragraph: WARRANTY OF CONSTRUCTION. Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect and other details deemed necessary by the Contracting Officer or his authorized representative for the execution of the construction warranty shall be established/reviewed at this meeting.

(b) In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the name, telephone number and address of the service

representative which is authorized to initiate and pursue warranty work action on behalf of the Contractor and surety. This single point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any Contractual responsibilities in connection with the paragraph: WARRANTY OF CONSTRUCTION.

(c) Local service area is defined as the area in which the contractor or his representative can meet the response times as described in paragraph 1.2.4 and in any event shall not exceed 200 miles radius of the construction site.

1.2.3 Equipment Warranty Identification

The Contractor shall provide warranty identification tags on all mechanical and electrical equipment installed under this contract. Tags and installation shall be in accordance with the requirements of Paragraph: EQUIPMENT WARRANTY IDENTIFICATION TAGS.

1.2.4 Warranty Service Calls

The Contractor or his local service representative will respond to the site, to a call within the time periods as follows: Four (4) hours for Heating, Air Conditioning, Refrigeration, Air Supply and Distribution, Critical Electrical service Systems and Food Service Equipment and Twenty-Four (24) hours For All Other Systems.

1.2.5 Equipment Warranty Booklet

At or before 30 days prior to final inspection and acceptance of the work, the Contractor shall submit the data mentioned as follows:

The Contractor shall provided a Booklet, which consists of a listing of all equipment items (see paragraphs a. and b. below) which are specified to be guaranteed along with the warranty papers for each piece of equipment. Three (3) legible bound copies of the booklet shall be submitted for approval and shall be indexed alphabetically by equipment type. For each specific guaranteed item, the name, address, and telephone number shall be shown on the list for the subcontractor who installed equipment, equipment supplier or distributor, and equipment manufacturer. Completion date of the guarantee period shall correspond to the applicable specification requirements for each guaranteed item. The names of service representatives that will make warranty calls along with the day, night, weekend and holiday contacts for response to a call within the time period specified shall also be identified.

a. For Equipment in Place: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer, etc. This would include capital equipment and other nonexpendable supplies of a movable nature that are not affixed as an integral part of the facility and may be removed without destroying or reducing the usefulness of the facility. Some examples are spare parts, special tools, manufacturing equipment, maintenance equipment, instruments, installed under this contract.

b. For Installed Building Equipment: The equipment list shall show unit retail value and nameplate data including model number, size, manufacturer,

etc. This would include items of equipment and furnishings (including material for installation thereof), which are required to make the facility usable and are affixed as a permanent part of the structure. Some examples are plumbing fixtures, laboratory counters and cabinets, kitchen equipment, mechanical equipment, electrical equipment, and fire protection systems installed under this contract.

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

Equipment Warranty Booklet; FIO

1.4 EQUIPMENT WARRANTY IDENTIFICATIONS TAGS

1.4.1 GENERAL REQUIREMENTS

The Contractor shall provide warranty identification tags on all Contractor and government furnished equipment which is Contractor installed.

1.4.1.1 Tags and Information

The tags and information shall be similar in format and size to the exhibits provided by this specification, and shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure- sensitive adhesive back, and shall be installed in a position that is easily (or most easily) noticeable. If the equipment surface is not suitable for adhesive back, Contractor shall submit his alternative to the Contracting Officer's Authorized Representative for review and approval. Contractor furnished equipment that has differing warranties on its components will have each component tagged.

1.4.1.2 Tags for Warranted Equipment

The tag for his equipment shall be similar to the following:

EQUIPMENT WARRANTY	
CONTRACTOR FURNISHED EQUIPMENT	
MFG-----	MODEL NO.-----
SERIAL NO.-----	
CONTRACT NO.-----	
CONTRACTOR NAME-----	
CONTRACTOR ADDRESS-----	

CONTRACTOR TELEPHONE-----
CONTRACTOR WARRANTY EXPIRES-----
IN CASE OF WARRANTY ACTION FIRST CONTACT
[DEH] [BCE] AT [TELEPHONE NUMBER]

EQUIPMENT WARRANTY	
GOVERNMENT FURNISHED EQUIPMENT	
MFG _____	MODEL NO. _____
SERIAL NO. _____	
CONTRACT NO. _____	
DATE EQUIP PLACED IN SERVICE _____	

1.4.1.3 Exclusion to Providing Tags

If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag. The Contractor's warranty expiration date and the final manufacturer's warranty expiration date will be determined as specified by the Paragraph "WARRANTY OF CONSTRUCTION".

1.4.2 EXECUTION

The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor shall be responsible for scheduling acceptance inspection with the Contracting Officer (verbal and written notification required). If this inspection is delayed by the Contractor, the Contractor shall, at his own expense, update the in-service and warranty expiration dates on these tags.

1.4.3 Equipment Warranty Tag Replacement

Under the terms of this contract, the Contractor's warranty with respect to work repaired or replaced shall run for one year from the date of repair or replacement. Such activity shall include a data warranty identification tag on the repaired or replaced equipment. The tag shall be furnished and installed by the Contractor, and shall be similar to the original tag, except that it should include the scope of repair and that the contractor's warranty expiration date will be one year from the date of acceptance of the repair or replacement. In the case of repair, the repair only will be covered by the extended warranty. In the case of replacement of a component, the component only will be covered by the extended warranty. In these cases, the original tags will not be removed, but an additional tag

will be installed for the repair or component replacement.

PART 2 NOT USED

PART 3 NOT USED

-- End of Section --

This page was intentionally left blank for duplex printing.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01320A

PROJECT SCHEDULE

08/01; Omaha Rev. 10/01

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 QUALIFICATIONS

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

- 3.1 GENERAL REQUIREMENTS
- 3.2 BASIS FOR PAYMENT
- 3.3 PROJECT SCHEDULE
 - 3.3.1 Use of the Critical Path Method
 - 3.3.2 Level of Detail Required
 - 3.3.2.1 Activity Durations
 - 3.3.2.2 Procurement Activities
 - 3.3.2.3 Critical Activities
 - 3.3.2.4 Government Activities
 - 3.3.2.5 Responsibility
 - 3.3.2.6 Work Areas
 - 3.3.2.7 Modification or Claim Number
 - 3.3.2.8 Bid Item
 - 3.3.2.9 Phase of Work
 - 3.3.2.10 Category of Work
 - 3.3.2.11 Feature of Work
 - 3.3.3 Scheduled Project Completion
 - 3.3.3.1 Project Start Date
 - 3.3.3.2 Constraint of Last Activity
 - 3.3.3.3 Early Project Completion
 - 3.3.4 Interim Completion Dates
 - 3.3.4.1 Start Phase
 - 3.3.4.2 End Phase
 - 3.3.4.3 Phase X
 - 3.3.5 Default Progress Data Disallowed
 - 3.3.6 Out-of-Sequence Progress
 - 3.3.7 Negative Lags
- 3.4 PROJECT SCHEDULE SUBMISSIONS
 - 3.4.1 Preliminary Project Schedule Submission
 - 3.4.2 Initial Project Schedule Submission
 - 3.4.3 Monthly Schedule Updates
 - 3.4.4 Standard Activity Coding Dictionary
- 3.5 SUBMISSION REQUIREMENTS
 - 3.5.1 Data Disks
 - 3.5.1.1 File Medium
 - 3.5.1.2 Disk Label

- 3.5.1.3 File Name
- 3.5.2 Narrative Report
- 3.5.3 Approved Changes Verification
- 3.5.4 Schedule Reports
 - 3.5.4.1 Activity Report
 - 3.5.4.2 Logic Report
 - 3.5.4.3 Total Float Report
 - 3.5.4.4 Earnings Report
- 3.5.5 Network Diagram
 - 3.5.5.1 Continuous Flow
 - 3.5.5.2 Project Milestone Dates
 - 3.5.5.3 Critical Path
 - 3.5.5.4 Banding
 - 3.5.5.5 S-Curves
- 3.6 PERIODIC PROGRESS MEETINGS
 - 3.6.1 Meeting Attendance
 - 3.6.2 Update Submission Following Progress Meeting
 - 3.6.3 Progress Meeting Contents
 - 3.6.3.1 Start and Finish Dates
 - 3.6.3.2 Time Completion
 - 3.6.3.3 Cost Completion
 - 3.6.3.4 Logic Changes
 - 3.6.3.5 Other Changes
- 3.7 REQUESTS FOR TIME EXTENSIONS
 - 3.7.1 Justification of Delay
 - 3.7.2 Submission Requirements
 - 3.7.3 Additional Submission Requirements
- 3.8 DIRECTED CHANGES
- 3.9 OWNERSHIP OF FLOAT

-- End of Section Table of Contents --

SECTION 01320A

PROJECT SCHEDULE

08/01; Omaha Rev. 10/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

ER 1-1-11 (1995) Progress, Schedules, and Network
Analysis Systems

1.2 QUALIFICATIONS

The Contractor shall designate an authorized representative who shall be responsible for the preparation of all required project schedule reports.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

Pursuant to the Contract Clause, SCHEDULE FOR CONSTRUCTION CONTRACTS, a Project Schedule as described below shall be prepared. The scheduling of construction shall be the responsibility of the Contractor. Contractor management personnel shall actively participate in its development. Subcontractors and suppliers working on the project shall also contribute in developing and maintaining an accurate Project Schedule. The approved Project Schedule shall be used to measure the progress of the work, to aid in evaluating time extensions, and to provide the basis of all progress payments. The scheduler shall be a direct employee of the prime contractor and have a minimum of 2 years experience in scheduling.

3.2 BASIS FOR PAYMENT

The schedule shall be the basis for measuring Contractor progress. Lack of an approved schedule or scheduling personnel will result in an inability of the Contracting Officer to evaluate Contractor's progress for the purposes of payment. Failure of the Contractor to provide all information, as specified below, shall result in the disapproval of the entire Project Schedule submission and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. In the case where Project Schedule revisions have been directed by the Contracting Officer and those revisions have not been included in the Project Schedule, the Contracting Officer may hold retainage up to the maximum allowed by contract, each payment period, until revisions to the Project Schedule have been made.

3.3 PROJECT SCHEDULE

The computer software system utilized by the Contractor to produce the Project Schedule shall be capable of providing all requirements of this specification. Failure of the Contractor to meet the requirements of this specification shall result in the disapproval of the schedule. Manual methods used to produce any required information shall require approval by the Contracting Officer.

3.3.1 Use of the Critical Path Method

The Critical Path Method (CPM) of network calculation shall be used to generate the Project Schedule. The Contractor shall provide the Project Schedule in the Precedence Diagram Method (PDM).

3.3.2 Level of Detail Required

The Project Schedule shall include an appropriate level of detail. Failure to develop or update the Project Schedule or provide data to the Contracting Officer at the appropriate level of detail, as specified by the Contracting Officer, shall result in the disapproval of the schedule. The Contracting Officer will use, but is not limited to, the following conditions to determine the appropriate level of detail to be used in the Project Schedule:

3.3.2.1 Activity Durations

Contractor submissions shall follow the direction of the Contracting Officer regarding reasonable activity durations. Reasonable durations are those that allow the progress of activities to be accurately determined between payment periods (usually less than 2 percent of all non-procurement activities' Original Durations are greater than 20 days).

3.3.2.2 Procurement Activities

Tasks related to the procurement of long lead materials or equipment shall be included as separate activities in the project schedule. Long lead materials and equipment are those materials that have a procurement cycle of over 90 days. Examples of procurement process activities include, but are not limited to: submittals, approvals, procurement, fabrication, and delivery.

3.3.2.3 Critical Activities

The following activities shall be listed as separate line activities on the Contractor's project schedule:

- a. Submission and approval of mechanical/electrical layout drawings.
- b. Submission and approval of O & M manuals.
- c. Submission and approval of as-built drawings.
- d. Submission and approval of 1354 data and installed equipment lists.
- e. Submission and approval of testing and air balance (TAB).
- f. Submission of TAB specialist design review report.

- g. Submission and approval of fire protection specialist.
- h. Submission and approval of testing and balancing of HVAC plus commissioning plans and data.
- i. Air and water balance dates.
- j. HVAC commissioning dates.
- k. Controls testing plan.
- l. Controls testing.
- m. Performance Verification testing.
- n. Other systems testing, if required.
- o. Prefinal inspection.
- p. Correction of punchlist from prefinal inspection.
- q. Final inspection.

3.3.2.4 Government Activities

Government and other agency activities that could impact progress shall be shown. These activities include, but are not limited to: approvals, inspections, utility tie-in, Government Furnished Equipment (GFE) and Notice to Proceed (NTP) for phasing requirements.

3.3.2.5 Responsibility

All activities shall be identified in the project schedule by the party responsible to perform the work. Responsibility includes, but is not limited to, the subcontracting firm, contractor work force, or government agency performing a given task. Activities shall not belong to more than one responsible party. The responsible party for each activity shall be identified by the Responsibility Code.

3.3.2.6 Work Areas

All activities shall be identified in the project schedule by the work area in which the activity occurs. Activities shall not be allowed to cover more than one work area. The work area of each activity shall be identified by the Work Area Code.

3.3.2.7 Modification or Claim Number

Any activity that is added or changed by contract modification or used to justify claimed time shall be identified by a mod or claim code that changed the activity. Activities shall not belong to more than one modification or claim item. The modification or claim number of each activity shall be identified by the Mod or Claim Number. Whenever possible, changes shall be added to the schedule by adding new activities. Existing activities shall not normally be changed to reflect modifications.

3.3.2.8 Bid Item

All activities shall be identified in the project schedule by the Bid Item

to which the activity belongs. An activity shall not contain work in more than one bid item. The bid item for each appropriate activity shall be identified by the Bid Item Code.

3.3.2.9 Phase of Work

All activities shall be identified in the project schedule by the phases of work in which the activity occurs. Activities shall not contain work in more than one phase of work. The project phase of each activity shall be by the unique Phase of Work Code.

3.3.2.10 Category of Work

All Activities shall be identified in the project schedule according to the category of work which best describes the activity. Category of work refers, but is not limited, to the procurement chain of activities including such items as submittals, approvals, procurement, fabrication, delivery, installation, start-up, and testing. The category of work for each activity shall be identified by the Category of Work Code.

3.3.2.11 Feature of Work

All activities shall be identified in the project schedule according to the feature of work to which the activity belongs. Feature of work refers, but is not limited to, a work breakdown structure for the project. The feature of work for each activity shall be identified by the Feature of Work Code.

3.3.3 Scheduled Project Completion

The schedule interval shall extend from NTP to the contract completion date.

3.3.3.1 Project Start Date

The schedule shall start no earlier than the date on which the NTP was acknowledged. The Contractor shall include as the first activity in the project schedule an activity called "Start Project". The "Start Project" activity shall have an "ES" constraint date equal to the date that the NTP was acknowledged, and a zero day duration.

3.3.3.2 Constraint of Last Activity

Completion of the last activity in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the critical path. The Contractor shall include as the last activity in the project schedule an activity called "End Project". The "End Project" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.3.3 Early Project Completion

In the event the project schedule shows completion of the project prior to the contract completion date, the Contractor shall identify those activities that have been accelerated and/or those activities that are scheduled in parallel to support the Contractor's "early" completion. Contractor shall specifically address each of the activities noted in the narrative report at every project schedule update period to assist the Contracting Officer in evaluating the Contractor's ability to actually

complete prior to the contract period.

3.3.4 Interim Completion Dates

Contractually specified interim completion dates shall also be constrained to show negative float if the early finish date of the last activity in that phase falls after the interim completion date.

3.3.4.1 Start Phase

The Contractor shall include as the first activity for a project phase an activity called "Start Phase X" where "X" refers to the phase of work. The "Start Phase X" activity shall have an "ES" constraint date equal to the date on which the NTP was acknowledged, and a zero day duration.

3.3.4.2 End Phase

The Contractor shall include as the last activity in a project phase an activity called "End Phase X" where "X" refers to the phase of work. The "End Phase X" activity shall have an "LF" constraint date equal to the completion date for the project, and a zero day duration.

3.3.4.3 Phase X

The Contractor shall include a hammock type activity for each project phase called "Phase X" where "X" refers to the phase of work. The "Phase X" activity shall be logically tied to the earliest and latest activities in the phase.

3.3.5 Default Progress Data Disallowed

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in CPM scheduling software systems. Actual Start and Finish dates on the CPM schedule shall match those dates provided from Contractor Quality Control Reports. Failure of the Contractor to document the Actual Start and Finish dates on the Daily Quality Control report for every in-progress or completed activity, and failure to ensure that the data contained on the Daily Quality Control reports is the sole basis for schedule updating shall result in the disapproval of the Contractor's schedule and the inability of the Contracting Officer to evaluate Contractor progress for payment purposes. Updating of the percent complete and the remaining duration of any activity shall be independent functions. Program features which calculate one of these parameters from the other shall be disabled.

3.3.6 Out-of-Sequence Progress

Activities that have posted progress without all preceding logic being satisfied (Out-of-Sequence Progress) will be allowed only on a case-by-case approval of the Contracting Officer. The Contractor shall propose logic corrections to eliminate all out of sequence progress or justify not changing the sequencing for approval prior to submitting an updated project schedule.

3.3.7 Negative Lags

Lag durations contained in the project schedule shall not have a negative value.

3.4 PROJECT SCHEDULE SUBMISSIONS

The Contractor shall provide the submissions as described below. The data disk, reports, and network diagrams required for each submission are contained in paragraph SUBMISSION REQUIREMENTS.

3.4.1 Preliminary Project Schedule Submission

The Preliminary Project Schedule, defining the Contractor's planned operations for the first 60 calendar days shall be submitted for approval within 20 calendar days after the NTP is acknowledged. The approved preliminary schedule shall be used for payment purposes not to exceed 60 calendar days after NTP.

3.4.2 Initial Project Schedule Submission

The Initial Project Schedule shall be submitted for approval within 40 calendar days after NTP. The schedule shall provide a reasonable sequence of activities which represent work through the entire project and shall be at a reasonable level of detail.

3.4.3 Monthly Schedule Updates

Based on the result of progress meetings, specified in "Monthly Progress Meetings," the Contractor shall submit monthly schedule updates. These submissions shall enable the Contracting Officer to assess Contractor's progress. If the Contractor fails or refuses to furnish the information and project schedule data, which in the judgement of the Contracting Officer or authorized representative is necessary for verifying the Contractor's progress, the Contractor shall be deemed not to have provided an estimate upon which progress payment may be made.

3.4.4 Standard Activity Coding Dictionary

The Contractor shall use the activity coding structure defined in the Standard Data Exchange Format (SDEF) in ER 1-1-11, Appendix A. This exact structure is mandatory, even if some fields are not used.

3.5 SUBMISSION REQUIREMENTS

The following items shall be submitted by the Contractor for the preliminary submission, initial submission, and every monthly project schedule update throughout the life of the project:

3.5.1 Data Disks

Two data disks containing the project schedule shall be provided. Data on the disks shall adhere to the SDEF format specified in ER 1-1-11, Appendix A.

3.5.1.1 File Medium

Required data shall be submitted on 3.5 disks, formatted to hold 1.44 MB of data, compatible with Microsoft Windows 95/98 operating systems, unless otherwise approved by the Contracting Officer.

3.5.1.2 Disk Label

A permanent exterior label shall be affixed to each disk submitted. The

label shall indicate the type of schedule (Preliminary, Initial, Update, or Change), full contract number, project name, project location, data date, name and telephone number or person responsible for the schedule.

3.5.1.3 File Name

Each file submitted shall have a name related to either the schedule data date, project name, or contract number. The Contractor shall develop a naming convention that will ensure that the names of the files submitted are unique. The Contractor shall submit the file naming convention to the Contracting Officer for approval.

3.5.2 Narrative Report

A Narrative Report shall be provided with the preliminary, initial, and each update of the project schedule. This report shall be provided as the basis of the Contractor's progress payment request. The Narrative Report shall include: a description of activities along the 2 most critical paths, a description of current and anticipated problem areas or delaying factors and their impact, and an explanation of corrective actions taken or required to be taken. The narrative report is expected to relay to the Government, the Contractor's thorough analysis of the schedule output and its plans to compensate for any problems, either current or potential, which are revealed through that analysis.

3.5.3 Approved Changes Verification

Only project schedule changes that have been previously approved by the Contracting Officer shall be included in the schedule submission. The Narrative Report shall specifically reference, on an activity by activity basis, all changes made since the previous period and relate each change to documented, approved schedule changes.

3.5.4 Schedule Reports

The format for each activity for the schedule reports listed below shall contain: Activity Numbers, Activity Description, Original Duration, Remaining Duration, Early Start Date, Early Finish Date, Late Start Date, Late Finish Date, Total Float. Actual Start and Actual Finish Dates shall be printed for those activities in progress or completed.

3.5.4.1 Activity Report

A list of all activities sorted according to activity number.

3.5.4.2 Logic Report

A list of Preceding and Succeeding activities for every activity in ascending order by activity number. Preceding and succeeding activities shall include all information listed above in paragraph Schedule Reports. A blank line shall be left between each activity grouping.

3.5.4.3 Total Float Report

A list of all incomplete activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates. Completed activities shall not be shown on this report.

3.5.4.4 Earnings Report

A compilation of the Contractor's Total Earnings on the project from the NTP until the most recent Monthly Progress Meeting. This report shall reflect the Earnings of specific activities based on the agreements made in the field and approved between the Contractor and Contracting Officer at the most recent Monthly Progress Meeting. Provided that the Contractor has provided a complete schedule update, this report shall serve as the basis of determining Contractor Payment. Activities shall be grouped by bid item and sorted by activity numbers. This report shall: sum all activities in a bid item and provide a bid item percent; and complete and sum all bid items to provide a total project percent complete. The printed report shall contain, for each activity: the Activity Number, Activity Description, Original Budgeted Amount, Total Quantity, Quantity to Date, Percent Complete (based on cost), and Earnings to Date.

3.5.5 Network Diagram

The network diagram shall be required on the initial schedule submission and on monthly schedule update submissions. The network diagram shall depict and display the order and interdependence of activities and the sequence in which the work is to be accomplished. The Contracting Officer will use, but is not limited to, the following conditions to review compliance with this paragraph:

3.5.5.1 Continuous Flow

Diagrams shall show a continuous flow from left to right with no arrows from right to left. The activity number, description, duration, and estimated earned value shall be shown on the diagram.

3.5.5.2 Project Milestone Dates

Dates shall be shown on the diagram for start of project, any contract required interim completion dates, and contract completion dates.

3.5.5.3 Critical Path

The critical path shall be clearly shown.

3.5.5.4 Banding

Activities shall be grouped to assist in the understanding of the activity sequence. Typically, this flow will group activities by category of work, work area and/or responsibility.

3.5.5.5 S-Curves

Earnings curves showing projected early and late earnings and earnings to date.

3.6 PERIODIC PROGRESS MEETINGS

Progress meetings to discuss payment shall include a monthly onsite meeting or other regular intervals mutually agreed to at the preconstruction conference. During this meeting the Contractor shall describe, on an activity by activity basis, all proposed revisions and adjustments to the project schedule required to reflect the current status of the project. The Contracting Officer will approve activity progress, proposed revisions,

and adjustments as appropriate.

3.6.1 Meeting Attendance

The Contractor's Project Manager and Scheduler shall attend the regular progress meeting.

3.6.2 Update Submission Following Progress Meeting

A complete update of the project schedule containing all approved progress, revisions, and adjustments, based on the regular progress meeting, shall be submitted not later than 4 working days after the monthly progress meeting.

3.6.3 Progress Meeting Contents

Update information, including Actual Start Dates, Actual Finish Dates, Remaining Durations, and Cost-to-Date shall be subject to the approval of the Contracting Officer. As a minimum, the Contractor shall address the following items on an activity by activity basis during each progress meeting.

3.6.3.1 Start and Finish Dates

The Actual Start and Actual Finish dates for each activity currently in-progress or completed .

3.6.3.2 Time Completion

The estimated Remaining Duration for each activity in-progress. Time-based progress calculations shall be based on Remaining Duration for each activity.

3.6.3.3 Cost Completion

The earnings for each activity started. Payment will be based on earnings for each in-progress or completed activity. Payment for individual activities will not be made for work that contains quality defects. A portion of the overall project amount may be retained based on delays of activities.

3.6.3.4 Logic Changes

All logic changes pertaining to NTP on change orders, change orders to be incorporated into the schedule, contractor proposed changes in work sequence, corrections to schedule logic for out-of-sequence progress, lag durations, and other changes that have been made pursuant to contract provisions shall be specifically identified and discussed.

3.6.3.5 Other Changes

Other changes required due to delays in completion of any activity or group of activities include: 1) delays beyond the Contractor's control, such as strikes and unusual weather. 2) delays encountered due to submittals, Government Activities, deliveries or work stoppages which make re-planning the work necessary. 3) Changes required to correct a schedule which does not represent the actual or planned prosecution and progress of the work.

3.7 REQUESTS FOR TIME EXTENSIONS

In the event the Contractor requests an extension of the contract completion date, or any interim milestone date, the Contractor shall furnish the following for a determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract: justification, project schedule data, and supporting evidence as the Contracting Officer may deem necessary. Submission of proof of delay, based on revised activity logic, duration, and costs (updated to the specific date that the delay occurred) is obligatory to any approvals.

3.7.1 Justification of Delay

The project schedule shall clearly display that the Contractor has used, in full, all the float time available for the work involved with this request.

The Contracting Officer's determination as to the number of allowable days of contract extension shall be based upon the project schedule updates in effect for the time period in question, and other factual information. Actual delays that are found to be caused by the Contractor's own actions, which result in the extension of the schedule, will not be a cause for a time extension to the contract completion date.

3.7.2 Submission Requirements

The Contractor shall submit a justification for each request for a change in the contract completion date of under 2 weeks based upon the most recent schedule update at the time of the NTP or constructive direction issued for the change. Such a request shall be in accordance with the requirements of other appropriate Contract Clauses and shall include, as a minimum:

- a. A list of affected activities, with their associated project schedule activity number.
- b. A brief explanation of the causes of the change.
- c. An analysis of the overall impact of the changes proposed.
- d. A sub-network of the affected area.

Activities impacted in each justification for change shall be identified by a unique activity code contained in the required data file.

3.7.3 Additional Submission Requirements

For any requested time extension of over 2 weeks, the Contracting Officer may request an interim update with revised activities for a specific change request. The Contractor shall provide this disk within 4 days of the Contracting Officer's request.

3.8 DIRECTED CHANGES

If the NTP is issued for changes prior to settlement of price and/or time, the Contractor shall submit proposed schedule revisions to the Contracting Officer within 2 weeks of the NTP being issued. The proposed revisions to the schedule will be approved by the Contracting Officer prior to inclusion of those changes within the project schedule. If the Contractor fails to submit the proposed revisions, the Contracting Officer may furnish the Contractor with suggested revisions to the project schedule. The Contractor shall include these revisions in the project schedule until revisions are submitted, and final changes and impacts have been negotiated. If the Contractor has any objections to the revisions

furnished by the Contracting Officer, the Contractor shall advise the Contracting Officer within 2 weeks of receipt of the revisions. Regardless of the objections, the Contractor shall continue to update the schedule with the Contracting Officer's revisions until a mutual agreement in the revisions is reached. If the Contractor fails to submit alternative revisions within 2 weeks of receipt of the Contracting Officer's proposed revisions, the Contractor will be deemed to have concurred with the Contracting Officer's proposed revisions. The proposed revisions will then be the basis for an equitable adjustment for performance of the work.

3.9 OWNERSHIP OF FLOAT

Float available in the schedule, at any time, shall not be considered for the exclusive use of either the Government or the Contractor.

-- End of Section --

This page was intentionally left blank for duplex printing.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01330

SUBMITTAL PROCEDURES

09/01; Omaha Update 10/01

PART 1 GENERAL

- 1.1 CONTRACTOR RESPONSIBILITIES
- 1.2 SUBMITTAL IDENTIFICATION (SD)
- 1.3 SUBMITTAL CLASSIFICATION
 - 1.3.1 Government Approved
 - 1.3.2 Information Only (FIO)
- 1.4 APPROVED SUBMITTALS
- 1.5 DISAPPROVED SUBMITTALS
- 1.6 WITHHOLDING OF PAYMENT
- 1.7 GENERAL
- 1.8 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER
- 1.9 SCHEDULING
- 1.10 TRANSMITTAL FORM (ENG FORM 4025)
- 1.11 SUBMITTAL PROCEDURES
 - 1.11.1 Procedures
 - 1.11.1.1 "G-ED or G-AE" Submittals
 - 1.11.1.2 "G-RE" and FIO Submittals
 - 1.11.1.3 Certificates of Compliance
 - 1.11.1.4 Purchase Orders
 - 1.11.1.5 Operation and Maintenance Instructions and/or Manuals
 - 1.11.1.6 Interior/Exterior Finish Sample and Data
 - 1.11.2 Deviations
- 1.12 CONTROL OF SUBMITTALS
- 1.13 GOVERNMENT APPROVED SUBMITTALS
 - 1.13.1 "G-AE" or "G-ED" Submittals
 - 1.13.2 "G-RE" Submittals
- 1.14 INFORMATION ONLY SUBMITTALS
- 1.15 STAMPS

-- End of Section Table of Contents --

SECTION 01330

SUBMITTAL PROCEDURES
09/01; Omaha Update 10/01

PART 1 GENERAL

Attachments: Submittal Register
ENG Form 4025, Transmittal Form

1.1 CONTRACTOR RESPONSIBILITIES

The Contractor is responsible for total management of his work including scheduling, control, and certification of all submittals. The submittal management system provided in these specifications is intended to be a complete system for the Contractor to use to control the quality of materials, equipment and workmanship provided by manufacturers, fabricators, suppliers and subcontractors. The Contractor shall review each submittal for contract compliance. Submittals that comply will be forwarded to the Government. Submittals that do not conform will be returned to the originator to be corrected. The Submittal Register (ENG Form 4288) will be utilized to log and monitor all submittal activities. No construction or installation activities shall be performed prior to required approvals of applicable submittals. The Contractor shall perform a check to assure that all materials and/or equipment have been tested, submitted and approved during the preparatory phase of quality control inspections.

1.2 SUBMITTAL IDENTIFICATION (SD)

Submittals required are identified by SD numbers and titles as follows:

SD-01 Preconstruction Submittals

Tabular lists showing location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work.

In addition, the following items are included:

Construction Progress Schedule
Health and safety plan
Work plan
Quality control plan
Environmental protection plan
Permits

SD-02 Shop Drawings

Submittals which graphically show relationship of various components of the work, schematic diagrams of systems, details of fabrication, layouts of particular elements, connections, and other relational aspects of the work.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work.

Physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuring work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Test Reports

Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with specified requirements. (Testing must have been within three years of date of contract award for the project.)

Report which includes findings of a test required to be performed by the contractor on an actual portion of the work or prototype prepared for the project before shipment to job site.

Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.

Investigation reports

Daily checklists

Final acceptance test and operational test procedure

SD-07 Certificates

A document, required of the Contractor, or through the Contractor, from a supplier, installer, manufacturer, or other lower tier Contractor, the purpose of which is to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality.

Statement signed by an official authorized to certify on behalf of the manufacturer of a product, system or material, attesting that the product, system or material meets specified requirements. The statement must be dated after the award of the contract, must state the Contractor's name and address, must name the project and location, and must list the specific requirements which are being certified.

Confined space entry permits.

SD-08 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and material safety data sheets, if any, concerning impedances, hazards, and safety precautions.

SD-09 Manufacturer's Field Reports

Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

Factory test reports.

SD-10 Operation and Maintenance Data

Data intended to be incorporated in operations and maintenance manuals.

SD-11 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

In addition, the following items are included:

As-built drawings

Special warranties

Posted operating instructions

Training plan

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 Government Approved

Governmental approval is required for extensions of design, critical materials, deviations, equipment whose compatibility with the entire system must be checked, and other items as designated by the Contracting Officer. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction," they are considered to be "shop drawings." All submittals noted in the technical specifications and Submittal Register as "G-ED", "G-AE" or "G-RE" are subject to Government Approval.

1.3.2 Information Only (FIO)

All submittals not requiring Government approval will be for information only. They are not considered to be "shop drawings" within the terms of the Contract Clause referred to above. The Contracting Officer has the option to review any submittal.

1.4 APPROVED SUBMITTALS

The Contracting Officer's approval of submittals shall not be construed as a complete check, but will indicate only that the general method of construction, materials, detailing and other information are satisfactory. Approval will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work. After submittals have been approved by the Contracting Officer, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.5 DISAPPROVED SUBMITTALS

The Contractor shall make all corrections required by the Contracting Officer and promptly furnish a corrected submittal in the form and number of copies specified for the initial submittal. If the Contractor considers any correction indicated on the submittals to constitute a change to the contract, a notice in accordance with the Contract Clause "Changes" shall be given promptly to the Contracting Officer.

1.6 WITHHOLDING OF PAYMENT

Payment for materials incorporated in the work will not be made if required approvals have not been obtained.

1.7 GENERAL

The Contractor shall make submittals as required by the specifications. The Contracting Officer may request submittals in addition to those specified when deemed necessary to adequately describe the work covered in the respective sections. Units of weights and measures used on all submittals shall be the same as those used in the contract drawings. Each submittal shall be complete and in sufficient detail to allow ready determination of compliance with contract requirements. Prior to submittal, all items shall be checked and approved by the Contractor's Quality Control (CQC) System Manager and each item shall be stamped, signed, and dated by the CQC System Manager indicating action taken. Proposed deviations from the contract requirements shall be clearly identified. Submittals shall include items such as: Contractor's, manufacturer's, or fabricator's drawings; descriptive literature including (but not limited to) catalog cuts, diagrams, operating charts or curves;

test reports; test cylinders; samples; O&M manuals (including parts list); certifications; warranties; and other such required submittals. Submittals requiring Government approval shall be scheduled and made prior to the acquisition of the material or equipment covered thereby. Samples remaining upon completion of the work shall be picked up and disposed of in accordance with manufacturer's Material Safety Data Sheets (MSDS) and in compliance with existing laws and regulations.

1.8 SUBMITTAL REGISTER AND ENG FORM 4288 (RMS) SUBMITTAL REGISTER

At the end of this section is a submittal register (submittal form) showing items of equipment and materials for which submittals are required by the specifications; this list may not be all inclusive and additional submittals may be required. The attached submittal register identifies only the submittal section, type of submittal, description of item submitted, paragraph number related to submittal item (section submittal paragraph if none listed), submittal classification (G), and submittal reviewer identifier (ED, AE or RE). Any submittal without a submittal classification and submittal reviewer identifier is considered to be For Information Only (FIO). The submittal register generated by the Government Resident Management System (RMS) Software is used for tracking construction submittals and is referred to as ENG Form 4288 (RMS). The Contractor shall maintain an ENG Form 4288 (RMS) for the project in accordance with the attached ENG Form 4288 (RMS) Instructions. The Contractor will be furnished one (1) set of ENG Forms 4288 (RMS) at the preconstruction conference. Much of the same information contained on the attached submittal register will be included on the ENG Forms 4288 (RMS) furnished to the Contractor. The Contractor shall complete the appropriate columns as indicated on the attached ENG Form 4288 (RMS) Instructions and return six (6) completed copies to the Contracting Officer for approval within 20 calendar days after the preconstruction conference. The ENG Form 4288 (RMS) will become a part of the contract after approval. Six (6) additional copies of a revised ENG Form 4288 (RMS) with ACTIVITY NO. filled in shall be submitted with the completed network analysis system when a network analysis system is a contract requirement. The TRANSMITTAL NUMBER AND ITEM NUMBER shall be left blank for use later to record the respective transmittal and item number corresponding to those listed on the transmittal form entitled: "TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE" (ENG Form 4025). The approved ENG Form 4288 (RMS) will become the scheduling document and will be used to control submittals throughout the life of the contract. The ENG Form 4288 (RMS) and the progress schedules shall be coordinated.

1.9 SCHEDULING

Submittals covering component items forming a system or items that are interrelated shall be scheduled to be coordinated and submitted concurrently. Certifications to be submitted with the pertinent drawings shall be so scheduled. Adequate time (a minimum of 20 calendar days exclusive of mailing time) shall be allowed and shown on the register for review and approval. No delay damages or time extensions will be allowed for time lost in late submittals.

1.10 TRANSMITTAL FORM (ENG FORM 4025)

The sample transmittal form (ENG Form 4025) attached to this section shall be used for submitting both Government approved and information only submittals in accordance with the instructions on the reverse side of the form. These forms will be furnished to the Contractor. This form shall be properly completed by filling out all the heading blank spaces and identifying each item submitted. Special care shall be exercised to ensure proper listing of the specification paragraph and/or sheet number of the contract drawings pertinent to the data submitted for each item.

1.11 SUBMITTAL PROCEDURES

Submittals shall be made as follows:

1.11.1 Procedures

1.11.1.1 "G-ED or G-AE" Submittals

All items listed as "G-ED" or "G-AE" submittals in the various sections or on the Submittal Register shall be mailed directly to the addressee shown below as directed. For each submittal, a completed information copy of the attached transmittal form shall also be mailed to the Area Engineer and Resident Engineer.

Technical Reviewer

TRIVERS
100 North Broadway
Suite 1800
St Louis, Missouri 63102

Each required submittal which is in the form of a drawing shall be submitted as seven (7) prints of the drawing. Drawing prints shall be either blue or black line permanent-type prints on a white background or blueprint and shall be sufficiently clear and suitable for making legible copies.

All catalog and descriptive data shall be submitted in seven (7) copies. Catalog cuts and other descriptive data which have more than one model, size, or type or which shows optional equipment shall be clearly marked to show the model, size, or type and all optional equipment which is proposed for approval. Submittals on component items forming a system or that are interrelated shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit.

1.11.1.2 "G-RE" and FIO Submittals

Except as noted below, data for all items listed as "G-RE" or FIO Submittals in the various sections shall be submitted in five (5) copies to the Area Engineer using the transmittal form. Items not to be submitted in multiples, such as samples and test cylinders, shall be submitted to the Area or Resident Engineer (as directed) accompanied by five (5) copies of the transmittal form.

1.11.1.3 Certificates of Compliance

Each certificate shall be signed by an official authorized to certify in behalf of the manufacturing company and shall contain the name and address of the Contractor, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Contractor from furnishing satisfactory material, if, after tests are performed on selected samples, the material is found not to meet the specific requirements.

1.11.1.4 Purchase Orders

Copies of purchase orders shall be furnished to the Contracting Officer when the Contractor requests assistance for expediting deliveries of equipment or materials, or when requested by the Contracting Officer for the purpose of quality assurance review. Each purchase order issued by the Contractor or his subcontractors for materials and equipment to be incorporated into the project shall (1) be clearly identified with the applicable DA contract number, (2) carry an identifying number, (3) be in sufficient detail to identify the material being purchased, (4) indicate a definite delivery date, and (5) display the DMS priority rating, if applicable.

1.11.1.5 Operation and Maintenance Instructions and/or Manuals

Where required by various technical sections, operations and maintenance instructions and/or manuals with parts lists included shall be provided by the Contractor in quintuplicate, unless otherwise specified, and shall be assembled in three-ring binders with index and tabbed section divider and having a cover indicating the contents by equipment or system name and project title and shall be submitted for approval to the Contracting Officer 90 days prior to final tests of mechanical and electrical systems, unless otherwise specified. Each operation and maintenance manual shall contain a copy of all warranties and a list of local service representatives required by Section 01200 Warranty of Construction. If field testing requires these copies to be revised, they shall be updated and resubmitted for approval within 10 calendar days after completion of tests.

1.11.1.6 Interior/Exterior Finish Sample and Data

All submittals for interior finish samples and data shall be submitted concurrently and all submittals for exterior finish samples and data shall be submitted concurrently.

1.11.2 Deviations

For submittals which include proposed deviations requested by the Contractor, the column "variation" of ENG Form 4025 shall be checked. The Contractor shall set forth in writing the reason for any deviations and annotate such deviations on the submittal. The Government reserves the right to rescind inadvertent approval of submittals containing unnoted deviations.

1.12 CONTROL OF SUBMITTALS

The Contractor shall carefully control his procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.13 GOVERNMENT APPROVED SUBMITTALS

Upon completion of review of submittals requiring Government approval, the submittals will be identified as having received approval by being so stamped and dated.

1.13.1 "G-AE" or "G-ED" Submittals

The drawing print and five (5) sets of all catalog data and descriptive literature and drawing prints will be retained by the Contracting Officer and two (2) sets of catalog data and descriptive literature and drawing prints will be returned to the Contractor.

1.13.2 "G-RE" Submittals

Two (2) copies of "G-RE" submittals for approval will be returned to the Contractor except for samples, test cylinders, and O&M manuals for which two (2) copies of the transmittal form only will be returned to the Contractor.

1.14 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the Contracting Officer is not required on information only submittals. The Government reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the Contracting Officer from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the Government laboratory or for check testing by the Government in those instances where the technical specifications so prescribe.

1.15 STAMPS

Stamps used by the Contractor on the submittal data to certify that the submittal meets contract requirements shall be similar to the following:

CONTRACTOR	
(Firm Name)	
_____	Approved
_____ Approved with corrections as noted on submittal data and/or attached sheets(s).	
SIGNATURE: _____	
TITLE: _____	
DATE: _____	

INSTRUCTIONS
ENG FORM 4288 (RMS)

1. The Contractor shall utilize the ENG Form 4288 (RMS) generated by the Government Residential Management System (RMS) software for tracking construction submittals. The Submittal Register information, columns (c) thru (f) from the Submittal Forms furnished with this solicitation, [will be utilized by the Government] to generate the ENG Form 4288 (RMS). [The Government will furnish the Contractor a hard copy of the ENG Form 4288 (RMS) at the preconstruction conference.]. The ENG Form 4288 (RMS) includes the following items and parties responsible for completing the information required on the ENG Form 4288 (RMS):

a. Activity Number: will be provided by the Contractor from his Network Analysis, if required, and when a network analysis is accepted.

b. Transmittal Number and Item Number: will be provided by the Contractor from ENG Form 4025 for each item.

c. Specification Paragraph Number: will be provided by the Government from the Submittal Register from column entitled "Specification Paragraph Number".

d. Description of Submittal: will be provided by the Government from the Submittal Register from column entitled "Description of Item Submitted".

e. Type of Submittal: will be provided by the Government from the Submittal Register from column entitled "Type of Submittal" or "Description of Item Submitted".

f. Classification: will be provided by the Government from the Submittal Register from column entitled "Classification".

g. Reviewing Office - Reviewer: will be provided by the Government from the Submittal Register from column entitled "Classification" or "Reviewer".

h. Contractor Schedule Dates: the Contractor will provide schedule dates for

"Submit Needed By" (Date the Contractor expects to submit an item. It is the Contractors responsibility to calculate the lead time needed for the government approval. Note if resubmittal is required it is the Contractors responsibility to make all adjustments necessary to meet the contract completion date.)

"Approval Needed By" (date the Contractor can receive approval and still obtain the material by need date.), and

"Material Needed By" (date that the material is needed at the site. If there is a network analysis it should reflect that date on the analysis.)

i. Contractor Action: Includes the following items: "Code" and "Submit to the Corps". These items will be completed by the Contractor. The action codes will be one of the following:

A - Approved as submitted.

B - Approved, except as noted.

C - Approved, except as noted. Refer to attached sheet resubmission required.

G - Other (specify)

j. Government Action: This item includes a Government Action "Code" and "Date" and is reserved for Government use. The Government reserves the right to review any submittal for contract compliance. Receipt of an Action Code "F - Receipt Acknowledged" or failure of the Contractor to receive an Action Code by the Government, does not mean that the submittal is in compliance with the contract requirements. When used by the Government, the action code will be one of the following:

A - Approved as submitted.

B - Approved except as noted on drawings.

C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.

D - Will be returned by separate correspondence.

E - Disapproved (See Attached).

F - Receipt Acknowledged.

Fx - Receipt acknowledged, does not comply as noted with contract requirements.

G - Other (specify).

2. Reviewer Abbreviation code will be as follows;

G-ED, G-AE or G-RE - Government Approved

For Information Only - Any submittal without a Government Approved abbreviation code.

INSTRUCTIONS
ENG FORM 4025

1. DATE at the top of form will be the date submitted to the Government which is to be completed by the Contractor.
2. TRANSMITTAL NO. Each new transmittal (i.e. G-AE, G-ED, G-RE or FIO) shall be numbered consecutively in the space provided in "Transmittal No.". This number will be the identifying symbol for each submittal. Example: "G-ED-001", "G-AE-002" "G-RE-003", "FIO-004", etc. For each new submittal or for a resubmittal, the appropriate box must be marked. Resubmittals must be designated by their original sequential number followed by an ".1", ".2", etc. for each sequential resubmittal. Example: "G-ED-001.1" (previous submittal No. G-ED-001).
3. TO: Box will contain the name and address of the office which will review the submittal. The name and address should be given in paragraph 3.5. Contractor is to complete this box after reviewing the classification provided by the government on Eng Form 4288 column f and determining the proper address.
4. FROM: Box will be the name and address of the Contractor. Contractor is to complete this box.
5. CONTRACT NO. box will contain the Contractors construction contract number (e.g., DACXXX-XX-C-XXXX).
6. CHECK ONE box will be completed by the Contractor with one box marked. If a resubmittal is provided last transmittal number will be added.
7. SPECIFICATION SECTION NO. box will be completed by the Contractor. The number will be the five digit number found in the specifications. No more than one section will be covered with each transmittal.
8. PROJECT TITLE AND LOCATION box will be completed by the Contractor.
9. Column a, will be completed by the Contractor and will contain a different number for each item submitted in that transmittal. Once a number is assigned to an item it will remain the same even if there is a resubmittal.
10. Column b, will be completed by the Contractor. The description of each item on this form will include the descriptions provided on the submittal register plus any other data necessary to describe the item. The Contractor shall submit each submittal register item all at once on one transmittal if possible. If a submittal register item can not be submitted all at once Contractor should note that in the remarks box. If a submittal register item requires several items, description shall contain submittal register description plus any additional specific descriptions. Additional items not on the submittal register will be noted in the remarks box.
11. Column c, will be completed by the Contractor. The information will be the appropriate submittal description number as described this Section or shown on the submittal register (e.g. SD-XX).
12. Column d, will be completed by the Contractor. The number of copies will be determined by the Contractor after review of submittal register for the classification of the item and after review of paragraph: SUBMITTAL

PROCEDURES of this Section.

13. Column e, will be completed by the Contractor. The Contractor shall state all applicable paragraph numbers.

14. Column f, will be completed by the Contractor. The Contractor shall state all applicable drawing sheet numbers.

15. Column g, will be completed by the Contractor. The action codes will be one of the following:

- A - Approved as submitted.
- B - Approved, except as noted.
- C - Approved, except as noted. Refer to attached sheet resubmission required.
- G - Other (specify)

16. Column h, will be completely by the Contractor. A check shall be placed in this column when a submittal is not in accordance with the plans and specifications also, a written statement to that effect shall be included in the space provided for "Remarks".

17. Column i, is reserved for Government use and may or may not be provided. When used by the Government, the action code will be one of the following:

- A - Approved as submitted.
- B - Approved except as noted on drawings.
- C - Approved, except as noted on drawings. Refer to attached ____ sheet resubmission required.
- D - Will be returned by separate correspondence.
- E - Disapproved (See Attached).
- F - Receipt Acknowledged.
- Fx - Receipt acknowledged, does not comply as noted with contract requirements.
- G - Other (specify).

18. REMARKS box self explained.

19. Contractor must sign all Eng Form 4025 certifying conformance.

20. Section II will be completed by the Government. Contractor is not to write in this space.

See reverse side of ENG Form 4025 for additional instructions.

-- End of Section --

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR REVW	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		00800	SD-01 Preconstruction Submittals														
			Site Plan		G RE												
			Dirt and Dust Control Plan		G RE												
			SD-04 Samples														
			Prototype Units	1.45	G RE												
		01200	SD-11 Closeout Submittals														
			Equipment Warranty Booklet	1.2.5													
			FIO														
		01355	SD-01 Preconstruction Submittals														
			Environmental Protection Plan	1.7	G RE												
		01400	SD-01 Preconstruction Submittals														
			Accident Prevention Plan		G RE												
			Respiratory Protection Program		G RE												
			SD-06 Test Reports														
			Exposure Assessment and Air Monitoring		G RE												
			SD-07 Certificates														
			Qualifications		G RE												
			Training Program														
			Medical Requirements														
		02500	SD-03 Product Data														
			Joint Sealant Literature														
			SD-04 Samples														
			Specified Samples		G RE												
			SD-06 Test Reports														
			Testing Laboratory Results														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		02800	SD-02 Shop Drawings														
			Wood Fence and Gates		G RE												
			SD-03 Product Data														
			Fence and Gate Material		G RE												
		02936	SD-07 Certificates														
			Grass and Seed Mixture														
			Sod														
			Certified Analysis of Soil														
			Amendments														
			SD-10 Operation and Maintenance														
			Data														
			Instructions and Procedures for														
			Establishment and Maintenance														
		02950	SD-07 Certificates														
			Certificate of Inspection														
			Certified Analysis for Fertilizer														
			Material														
		03300	SD-02 Shop Drawings														
			Reinforcement		G RE												
			SD-05 Design Data														
			Concrete Materials and Mix		G RE												
			Design														
			SD-06 Test Reports														
			Concrete Materials		G RE												
		03930	SD-01 Preconstruction Submittals														
			Inspection Reports		G RE												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION OR REVIEW R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		03930	SD-07 Certificates														
			Firms Qualifications		G RE												
		05500	SD-02 Shop Drawings														
			Fabrication and Erection		G RE												
			SD-08 Manufacturer's Instructions														
			Plastic Area Well Covers														
		06100	SD-07 Certificates														
			Treatment														
		06200	SD-04 Samples														
			Lumber and Plywood		G RE												
		07210	SD-03 Product Data														
			Insulation Material		G RE												
			SD-07 Certificates														
			Insulation														
			SD-08 Manufacturer's Instructions														
			Installation Instructions														
		07311	SD-03 Product Data														
			Asphalt Shingle Data														
			SD-04 Samples														
			Shingles		G RE												
			SD-07 Certificates														
			Shingle Applicator Qualifications														
			SD-08 Manufacturer's Instructions														
			Installation Instructions														
		07465	SD-03 Product Data														
			Soffit & Trim Data														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR REVIEW R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		07465	SD-04 Samples														
			Soffit & Trim		G RE												
			SD-08 Manufacturer's Instructions														
			Installation Instructions														
		07600	SD-03 Product Data														
			Flashing & Sheet Metal Data														
			SD-04 Samples														
			Material Samples		G RE												
			SD-08 Manufacturer's Instructions														
			Installation Instructions														
		07900	SD-03 Product Data														
			Manufacturer's Product Data														
			SD-08 Manufacturer's Instructions														
			Installation Instructions														
		08110	SD-02 Shop Drawings														
			Door Schedule (Door & Frame Sizes)		G RE												
			SD-03 Product Data														
			Manufacturer's Product Data														
		08210	SD-02 Shop Drawings														
			Door Schedule		G RE												
			SD-03 Product Data														
			Manufacturer's Product Data														
			SD-04 Samples														
			Corner Scetion		G RE												
		08630	SD-02 Shop Drawings														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR												
CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND																		
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		08630	Vinyl Windows		G RE													
			SD-03 Product Data															
			Manufacturer's Product Data															
			SD-06 Test Reports															
			Performance Requirements															
		08700	SD-03 Product Data															
			Hardware Schedule		G RE													
			Keying Schedule		G RE													
			Templates		G RE													
			Manufacturer's Product Data															
			SD-10 Operation and Maintenance															
			Data															
			Operating and Maintenance															
			Requirements															
		09260	SD-03 Product Data															
			Manufacturer's Product Data															
			SD-08 Manufacturer's Instructions															
			Installation Instructions															
		09650	SD-03 Product Data															
			Manufacturer's Product Data															
			SD-04 Samples															
			Resilient Sheet Flooring															
			SD-07 Certificates															
			Flooring															
			SD-08 Manufacturer's Instructions															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR												
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR A/E REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		09650	Installation and Maintenance Instructions															
		09680	SD-03 Product Data															
			Manufacturer's Product Data															
			SD-04 Samples															
			Carpet															
			SD-07 Certificates															
			Carpet															
			SD-08 Manufacturer's Instructions															
			Installation and Maintenance Instructions															
		09900	SD-03 Product Data															
			Manufacturer's Product Data															
			Paint Schedule		G RE													
			SD-04 Samples															
			Painted/Stained Material Samples		G RE													
		11450	SD-03 Product Data															
			Residential Equipment Schedule		G RE													
			SD-08 Manufacturer's Instructions															
			Manufactures Specifications and Installation		G RE													
		12370	SD-02 Shop Drawings															
			Casework		G RE													
			Coutertops		G RE													
			SD-03 Product Data															
			Casework		G RE													

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR												
CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND																		
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASS SIFIC ATION REV W R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		12370	SD-04 Samples															
			Color Charts		G RE													
			Base and wall Cabinet Samples		G RE													
			SD-07 Certificates															
			Materrals															
		12492	SD-03 Product Data															
			Louver Blinds		G RE													
			SD-04 Samples															
			Color Components		G RE													
			Verification Samples		G RE													
			SD-06 Test Reports															
			Louver Blinds															
			SD-07 Certificates															
			Louver Blind Materials															
			SD-10 Operation and Maintenance															
			Data															
			Maintenance Data for Louver															
			Blinds															
		12510	SD-02 Shop Drawings															
			Window Coverings															
			SD-03 Product Data															
			Window Coverings															
			Color Schedule		G RE													
			SD-04 Samples															
			Blind Sample		G RE													
			SD-08 Manufacturer's Instructions															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFABF, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASS SPEC A/E REV W R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		12510	Window Coverings														
		15050	SD-07 Certificates														
			Welder Certificates														
		15100	SD-03 Product Data														
			Valve Types		G AE												
			SD-10 Operation and Maintenance														
			Data														
			Valve Operation and Maintenance														
		15145	SD-03 Product Data														
			Hanger and Support Types														
		15170	SD-03 Product Data														
			Motors														
		15260	SD-03 Product Data														
			Pipe Insulation														
			SD-04 Samples														
			Insulation and Jacket		G RE												
			SD-06 Test Reports														
			Testing Certification														
			SD-07 Certificates														
			Material Certification														
		15411	SD-04 Samples														
			Water Samples		G RE												
			SD-06 Test Reports														
			Test Results and Reports		G RE												
		15420	SD-06 Test Reports														
			Test Results and Reports		G RE												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR												
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION OR REVIEW R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		15430	SD-03 Product Data															
			Arresters		G RE													
			Trap Seal Primer Valve		G RE													
			Drain Valves															
			Hose Bibbs and Hydrant		G RE													
			Out-Let Boxes and Washers															
			Cleanouts															
			Floor Drains															
			Vent caps, Terminals & and Roof		G RE													
			Flashing Assemblies															
			Sleeve Penetration Systems		G RE													
			SD-10 Operation and Maintenance															
			Data															
			Trap Seal Primer Valves															
			Maintenance															
		15440	SD-03 Product Data															
			Fixtures		G RE													
			Manufactures Wiring Diagrams															
			SD-10 Operation and Maintenance															
			Data															
			Plumbing Fixtures															
		15452	SD-02 Shop Drawings															
			Layout and Connections		G RE													
			SD-03 Product Data															
			Sump Pumps															
			Wiring Diagrams															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASS SPEC ATTN OR A/E REV WR	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION			APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		15452	SD-07 Certificates														
			Product Certificates														
		15496	SD-03 Product Data														
			Natural Gas Specialty and Valves		G RE												
		15671	SD-03 Product Data														
			Condensing Units		G AE												
			Wiring Diagrams														
			SD-06 Test Reports														
			Field Test Reports														
			SD-10 Operation and Maintenance														
			Data														
			Condensing Units														
		15853	SD-03 Product Data														
			Power Ventilators		G RE												
			Wiring Diagrams														
			SD-07 Certificates														
			Certified Performance Curves														
			Certified Sound Ratings														
			SD-10 Operation and Maintenance														
			Data														
			Power Ventilators														
		15855	SD-03 Product Data														
			Data Sheets		G RE												
			Assembly Drawings		G RE												
			Performance Data														
			Schedule														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR											
CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION OR REVIEW NUMBER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		15855	Coordination Drawing		G RE												
			SD-04 Samples														
			Manufacturer's Color Charts		G RE												
			Registers and Grilles		G RE												
		15891	SD-02 Shop Drawings														
			Duct Fabrication		G AE												
			SD-03 Product Data														
			Coordination Installation Drawings		G RE												
			Sealing Materials														
			SD-07 Certificates														
			Welding														
			Certified Sound Ratings														
			SD-11 Closeout Submittals														
			Record Drawings		G RE												
		15910	SD-03 Product Data														
			Volume Control Dampers		G RE												
			Access Panels and Doors														
			Flexible Ducts														
		16050	SD-02 Shop Drawings														
			Supports, Anchoring & Fabrication		G RE												
			SD-03 Product Data														
			Joint Sealers														
			SD-07 Certificates														
			Welders														
			SD-08 Manufacturer's Instructions														
			Installation Instructions														

SUBMITTAL REGISTER												CONTRACT NO.					
TITLE AND LOCATION						CONTRACTOR											
CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND																	
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASS SPEC FIC ATTION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY			MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE			DATE OF ACTION
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16110	SD-03 Product Data														
			Raceway and Fittings		G RE												
		16119	SD-03 Product Data														
			Ducts & Fittings		G RE												
			Supports		G RE												
			Coordination Drawings		G RE												
		16120	SD-03 Product Data														
			Wires and Cables														
			Test Data Forms														
		16121	SD-03 Product Data														
			Wires, Cables and Connectors														
			Test Data Forms														
			SD-07 Certificates														
			Wires, Cables & Connectors														
		16124	SD-03 Product Data														
			Cables and Accessories		G RE												
			SD-06 Test Reports														
			Product Test Reports														
			SD-07 Certificates														
			Certified Test Reports														
			Qualifications of Firm's		G RE												
			Experience														
			SD-10 Operation and Maintenance														
			Data														
			Cables and Accessories														
		16135	SD-02 Shop Drawings														

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16135	Shop Fabricated Items		G RE												
			SD-03 Product Data														
			Boxes (Pull, Junction & Floor)		G RE												
			Fittings, Cabinets, & Enclosures		G RE												
		16143	SD-03 Product Data														
			Devices														
			SD-04 Samples														
			Devices, Colors, & Finishes		G RE												
		16170	SD-03 Product Data														
			Manufacturer's Product Data														
			SD-10 Operation and Maintenance														
			Data														
			Maintenance Data														
		16190	SD-02 Shop Drawings														
			Details and Assembly		G AE												
			Registered Certified Shop		G AE												
			Drawings														
			SD-03 Product Data														
			Devices														
		16195	SD-03 Product Data														
			Schedule of ID														
			SD-04 Samples														
			Color and Lettering		G RE												
		16321	SD-03 Product Data														
			Transformers		G AE												
			Wiring Diagrams		G AE												

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION						CONTRACTOR												
CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND																		
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH	GOVT CLASSIFICATION OR REVIEW R	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS	
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	
		16321	SD-06 Test Reports															
			Product Test Reports															
			SD-07 Certificates															
			Firms Qualifications and Experience		G RE													
			Certified Test Reports															
			SD-10 Operation and Maintenance Data															
			Transformers															
		16322	SD-02 Shop Drawings															
			Sectionalizing Cabinets		G AE													
			SD-03 Product Data															
			Sectionalizing Cabinets		G AE													
			Wiring Diagrams		G AE													
			SD-06 Test Reports															
			Product Test Reports															
			SD-07 Certificates															
			Firms Qualifications and Experience		G RE													
			Certified Test Reports															
			SD-10 Operation and Maintenance Data															
			Sectionalizing Cabinets															
		16370	SD-03 Product Data															
			Manufacturer's Equipment		G AE													
			Catalog Cuts															

SUBMITTAL REGISTER

CONTRACT NO.

TITLE AND LOCATION CNO1 REPAIR MFH HOLLY PHASE 1 (30CN), GFAFB, ND						CONTRACTOR											
ACTIVITY NO	TRANSMITTAL NO	SPEC SECT	DESCRIPTION ITEM SUBMITTED	PARAGRAPH #	GOVT CLASSIFICATION OR REVIEWER	CONTRACTOR: SCHEDULE DATES			CONTRACTOR ACTION		DATE FWD TO APPR AUTH/ DATE RCD FROM CONTR	APPROVING AUTHORITY				MAILED TO CONTR/ DATE RCD FRM APPR AUTH	REMARKS
						SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	ACTION CODE	DATE OF ACTION		DATE FWD TO OTHER REVIEWER	DATE RCD FROM OTH REVIEWER	ACTION CODE	DATE OF ACTION		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
		16370	SD-05 Design Data														
			Design Tests		G AE												
			SD-06 Test Reports														
			Wood Pole and Crossarms														
			Field Test Reports														
			Transformer Test Schedule		G AE												
			SD-07 Certificates														
			Certification of Transformer														
			Certified Test Reults														
		16452	SD-03 Product Data														
			Grounding Rods and Equipment		G AE												
			Test Data Form														
		16470	SD-02 Shop Drawings														
			Panelboard Types		G AE												
			SD-03 Product Data														
			Panelboards		G RE												
			Wiring Diagrams														
			Panel Schedules														
			Test Forms														
			SD-10 Operation and Maintenance														
			Data														
			Panelboards														
		16512	SD-02 Shop Drawings														
			Fixture Drawings		G RE												
			SD-03 Product Data														
			Fixture Data and Catelog Cuts		G RE												

CONTRACT NO.

CONTRACTOR

[illegible]

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE <i>(Read instructions on the reverse side prior to initiating this form)</i>	DATE	TRANSMITTAL NO.
---	------	-----------------

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:	FROM:	CONTRACT NO.	CHECK ONE: <input type="checkbox"/> THIS IS A NEW TRANSMITTAL <input type="checkbox"/> THIS IS A RESUBMITTAL OF TRANSMITTAL _____
SPECIFICATION SEC. NO. <i>(Cover only one section with each transmittal)</i>	PROJECT TITLE AND LOCATION		CHECK ONE: THIS TRANSMITTAL IS FOR <input type="checkbox"/> FIO <input type="checkbox"/> GOV'T. APPROVAL

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED <i>(Type size, model number/etc.)</i>	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. <i>(See instruction no. 8)</i>	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		FOR CONTRACTOR USE CODE	VARIATION <i>(See instruction No. 6)</i>	FOR CE USE CODE
				SPEC. PARA. NO.	DRAWING SHEET NO.			
<i>a.</i>	<i>b.</i>	<i>c.</i>	<i>d.</i>	<i>e.</i>	<i>f.</i>	<i>g.</i>	<i>h.</i>	<i>i.</i>

REMARKS	I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as other wise stated. _____ NAME AND SIGNATURE OF CONTRACTOR
---------	---

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED <i>(List by Item No.)</i>	NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY	DATE
---	--	------

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.
2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.
4. Submittals requiring expeditious handling will be submitted on a separate form.
5. Separate transmittal form will be used for submittals under separate sections of the specifications.
6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
7. Form is self-transmittal, letter of transmittal is not required.
8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A	--	Approved as submitted.	E	--	Disapproved (See attached).
B	--	Approved, except as noted on drawings.	F	--	Receipt acknowledged.
C	--	Approved, except as noted on drawings. Refer to attached sheet resubmission required.	FX	--	Receipt acknowledged, does not comply as noted with contract requirements.
D	--	Will be returned by separate correspondence.	G	--	Other (<i>Specify</i>)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

10/00

- 3.5.1 Solid Wastes
- 3.5.2 Chemicals and Chemical Wastes
- 3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials
- 3.5.4 Fuel and Lubricants
- 3.5.5 Waste Water
- 3.6 RECYCLING AND WASTE MINIMIZATION
- 3.7 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT
- 3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES
- 3.9 BIOLOGICAL RESOURCES
- 3.10 INTEGRATED PEST MANAGEMENT
 - 3.10.1 Pesticide Delivery and Storage
 - 3.10.2 Qualifications
 - 3.10.3 Pesticide Handling Requirements
 - 3.10.4 Application
- 3.11 PREVIOUSLY USED EQUIPMENT
- 3.12 MAINTENANCE OF POLLUTION FACILITIES
- 3.13 MILITARY MUNITIONS
- 3.14 TRAINING OF CONTRACTOR PERSONNEL
- 3.15 POST CONSTRUCTION CLEANUP

-- End of Section Table of Contents --

SECTION 01355

ENVIRONMENTAL PROTECTION

10/00

PART 1 GENERAL

Attachments:

Grand Forks AFB Recycling Opportunities for Industrial Facilities
Additional Recycling Opportunities

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AIR FORCE INSTRUCTION

AFI 32-1053 Pest Management Program

CODE OF FEDERAL REGULATIONS (CFR)

33 CFR 328	Definitions
40 CFR 68	Chemical Accident Prevention Provisions
40 CFR 152 - 186	Pesticide Programs
40 CFR 260	Hazardous Waste Management System: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 279	Standards for the Management of Used Oil
40 CFR 302	Designation, Reportable Quantities, and Notification
40 CFR 355	Emergency Planning and Notification
49 CFR 171 - 178	Hazardous Materials Regulations

ENGINEERING MANUALS (EM)

EM 385-1-1 (1996) U.S. Army Corps on Engineers Safety and Health Requirements Manual

GRAND FORKS AFB

HWPM 319 ARW 7042-970314 Hazardous Waste Management Plan

FRP	Facility Response Plan
NDRO2-0314	Grand Forks North Dakota Pollutant Discharge Elimination System (NDPDES) Industrial Storm Water Discharge Permit
SPCCP	Spill Prevention Control and Counter-measures Plan (SPCCP)
SWPPP	Storm Water Pollution Prevention Plan

NORTH DAKOTA ADMINISTRATION CODE

33-15-13-02	Air Pollution Control Rules
33-15-17	Restriction of Fugitive Emissions

US ARMY CORPS OF ENGINEERS TECHNICAL REPORT

WETLAND MANUAL	Corps of Engineers Wetlands Delineation Manual Technical Report Y-87-1
----------------	---

1.2 DEFINITIONS

1.2.1 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally and/or historically.

1.2.2 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.3 Contractor Generated Hazardous Waste

Contractor generated hazardous waste means materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene etc.), waste thinners, excess paints, excess solvents, waste solvents, and excess pesticides, and contaminated pesticide equipment rinse water.

1.2.4 Installation Pest Management Coordinator

Installation Pest Management Coordinator (IPMC) is the individual officially designated by the Installation Commander to oversee the Installation Pest Management Program and the Installation Pest Management

Plan.

1.2.5 Land Application for Discharge Water

The term "Land Application" for discharge water implies that the Contractor shall discharge water at a rate which allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" shall occur. Land Application shall be in compliance with all applicable Federal, State, and local laws and regulations.

1.2.6 Pesticide

Pesticide is defined as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant or desiccant.

1.2.7 Pests

The term "pests" means arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds and other organisms (except for human or animal disease-causing organisms) that adversely affect readiness, military operations, or the well-being of personnel and animals; attack or damage real property, supplies, equipment, or vegetation; or are otherwise undesirable.

1.2.8 Surface Discharge

The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "waters of the United States" and would require a permit to discharge water from the governing agency.

1.2.9 Waters of the United States

All waters which are under the jurisdiction of the Clean Water Act, as defined in 33 CFR 328.

1.2.10 Wetlands

Wetlands means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and bogs. Official determination of whether or not an area is classified as a wetland must be done in accordance with WETLAND MANUAL.

1.3 GENERAL REQUIREMENTS

The Contractor shall minimize environmental pollution and damage that may occur as the result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of this contract. The Contractor shall comply with all applicable environmental Federal, State, and local laws and regulations. The Contractor shall be responsible for any delays resulting from failure to comply with environmental laws and regulations.

1.4 SUBCONTRACTORS

The Contractor shall ensure compliance with this section by subcontractors.

1.5 PAYMENT

No separate payment will be made for work covered under this section. The Contractor shall be responsible for payment of fees associated with environmental permits, application, and/or notices obtained by the Contractor. All costs associated with this section shall be included in the contract price. The Contractor shall be responsible for payment of all fines/fees for violation or non-compliance with Federal, State, Regional and local laws and regulations.

1.6 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Environmental Protection Plan; G-RE

The environmental protection plan.

1.7 ENVIRONMENTAL PROTECTION PLAN

Prior to commencing construction activities or delivery of materials to the site, the Contractor shall submit an Environmental Protection Plan for review and approval by the Contracting Officer. The purpose of the Environmental Protection Plan is to present a comprehensive overview of known or potential environmental issues which the Contractor must address during construction. Issues of concern shall be defined within the Environmental Protection Plan as outlined in this section. The Contractor shall address each topic at a level of detail commensurate with the environmental issue and required construction task(s). Topics or issues which are not identified in this section, but which the Contractor considers necessary, shall be identified and discussed after those items formally identified in this section. Prior to submittal of the Environmental Protection Plan, the Contractor shall meet with the Contracting Officer for the purpose of discussing the implementation of the initial Environmental Protection Plan; possible subsequent additions and revisions to the plan including any reporting requirements; and methods for administration of the Contractor's Environmental Plans. The Contractor shall maintain a current version of the Environmental Protection Plan on site for review by interested parties.

1.7.1 Compliance

No requirement in this Section shall be construed as relieving the Contractor of any applicable Federal, State, and local environmental protection laws and regulations. During Construction, the Contractor shall be responsible for identifying, submitting for approval, and implementing any additional requirements to be included in the Environmental Protection Plan.

1.7.2 Contents

The environmental protection plan shall include, but shall not be limited to, the following:

- a. Name(s) of person(s) within the Contractor's organization who is(are) responsible for ensuring adherence to the Environmental Protection Plan.
- b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site, if applicable.
- c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. An erosion and sediment control plan which identifies the type and location of the erosion and sediment controls to be provided. The plan shall include monitoring and reporting requirements to assure that the control measures are in compliance with the erosion and sediment control plan, Federal, State, and local laws and regulations. A Storm Water Pollution Prevention Plan (SWPPP) may be substituted for this plan.
- f. Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on the site.
- g. Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plan shall include measures to minimize the amount of mud transported onto paved public roads by vehicles or runoff.
- h. Work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas including methods for protection of features to be preserved within authorized work areas.
- i. Drawing showing the location of borrow areas.
- j. The Spill Control plan shall include the procedures, instructions, and reports to be used in the event of an unforeseen spill of a substance regulated by 40 CFR 68, 40 CFR 302, 40 CFR 355, and/or regulated under State or Local laws and regulations. The Spill Control Plan supplements the requirements of EM 385-1-1 and Grand Forks AFB's FRP Facility Response Plan and SPCCP Spill Prevention and Counter-measures Plan that may be reviewed at Grand Forks AFB Environmental Flight. This plan shall include as a minimum:
 1. The name of the individual who will report any spills or hazardous substance releases and who will follow up with complete documentation. This individual shall immediately notify the Contracting Officer and Facility Fire Department Facility Response Personnel Facility Environmental Office in addition to the legally

required Federal, State, and local reporting channels (including the National Response Center 1-800-424-8802) if a reportable quantity is released to the environment. The plan shall contain a list of the required reporting channels and telephone numbers.

2. The name and qualifications of the individual who will be responsible for implementing and supervising the containment and cleanup.

3. Training requirements for Contractor's personnel and methods of accomplishing the training.

4. A list of materials and equipment to be immediately available at the job site, tailored to cleanup work of the potential hazard(s) identified.

5. The names and locations of suppliers of containment materials and locations of additional fuel oil recovery, cleanup, restoration, and material-placement equipment available in case of an unforeseen spill emergency.

6. The methods and procedures to be used for expeditious contaminant cleanup.

k. A non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris. The plan shall include schedules for disposal. The Contractor shall identify any subcontractors responsible for the transportation and disposal of solid waste. Licenses or permits shall be submitted for solid waste disposal sites that are not a commercial operating facility. Evidence of the disposal facility's acceptance of the solid waste shall be attached to this plan during the construction. The Contractor shall attach a copy of each of the Non-hazardous Solid Waste Diversion Reports to the disposal plan. The report shall be submitted on the first working day after the first quarter that non-hazardous solid waste has been disposed and/or diverted and shall be for the previous quarter (e.g. the first working day of January, April, July, and October). The report shall indicate the total amount of waste generated and total amount of waste diverted in cubic yards or tons along with the percent that was diverted.

l. A recycling and solid waste minimization plan with a list of measures to reduce consumption of energy and natural resources. The plan shall detail the Contractor's actions to comply with and to participate in Federal, State, Regional, and local government sponsored recycling programs to reduce the volume of solid waste at the source.

m. An air pollution control plan detailing provisions to assure that dust, debris, materials, trash, etc., do not become air borne and travel off the project site.

n. A contaminant prevention plan that: identifies potentially hazardous substances to be used on the job site; identifies the intended actions to prevent introduction of such materials into the air, water, or ground; and details provisions for compliance with Federal, State, and local laws and regulations for storage and handling of these materials. In accordance with EM 385-1-1, a copy of the Material Safety Data Sheets (MSDS) and the maximum quantity of each hazardous material to be on site at any given time shall be included in

the contaminant prevention plan. As new hazardous materials are brought on site or removed from the site, the plan shall be updated.

o. A waste water management plan that identifies the methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines. If a settling/retention pond is required, the plan shall include the design of the pond including drawings, removal plan, and testing requirements for possible pollutants. If land application will be the method of disposal for the waste water, the plan shall include a sketch showing the location for land application along with a description of the pretreatment methods to be implemented. If surface discharge will be the method of disposal, a copy of the permit and associated documents shall be included as an attachment prior to discharging the waste water. If disposal is to a sanitary sewer, the plan shall include documentation that the Waste Water Treatment Plant Operator has approved the flow rate, volume, and type of discharge.

p. A historical, archaeological, cultural, biological, and wetland resources plan that defines procedures for identifying and protecting the resources known to be on the project site and/or any resources discovered during construction. The plan shall identify lines of communication between Contractor personnel and the Contracting Officer.

q. A pesticide treatment plan shall be included and updated, as information becomes available. The plan shall include: sequence of treatment, dates, times, locations, pesticide trade name, EPA registration numbers, authorized uses, chemical composition, formulation, original and applied concentration, application rates of active ingredient (i.e. pounds of active ingredient applied), equipment used for application and calibration of equipment. The Contractor is responsible for Federal, State, Regional and Local pest management record keeping and reporting requirements as well as any additional Installation specific requirements. The Contractor shall follow AFI 32-1053 Sections 3.4.13 and 3.4.14 for data required to be reported to the Installation.

1.7.3 Appendix

Copies of all Contractor's environmental permits, permit application packages, approvals to construct, notifications, certifications, reports, and termination documents shall be attached, as an appendix, to the Environmental Protection Plan.

1.8 PROTECTION FEATURES

This paragraph supplements the Contract Clause PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS. Prior to start of any on site construction activities, the Contractor and the Contracting Officer shall make a joint condition survey. Immediately following the survey, the Contractor shall prepare a brief report including a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. This survey report shall be signed by both the the

Contractor and the Contracting Officer upon mutual agreement as to its accuracy and completeness. The Contractor shall protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference which their preservation may cause to the Contractor's work under the contract.

1.9 ENVIRONMENTAL ASSESSMENT OF CONTRACT DEVIATIONS

Any deviations, requested by the Contractor, from the drawings, plans and specifications which may have an environmental impact will be subject to approval by the Contracting Officer and may require an extended review, processing, and approval time. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

1.10 NOTIFICATION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with Federal, State or local environmental laws or regulations, permits, and other elements of the Contractor's Environmental Protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of the proposed corrective action and take such action when approved by the Contracting Officer. The Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions shall be granted or equitable adjustments allowed to the Contractor for any such suspensions. This is in addition to any other actions the Contracting Officer may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 ENVIRONMENTAL PERMITS, NOTIFICATIONS AND COMMITMENTS

The Contractor shall be responsible for obtaining and complying with all environmental permits, notifications and commitments required by Federal, State, Regional, and local environmental laws and regulations. The Asbestos NESHAP, 33-15-13-02 of the North Dakota Air Pollution Control Rules, requires written notification of demolition or renovation activities under Subsection 02.6. The Contractor (through the Contracting Officer) shall coordinate the written Notification to State of North Dakota with Grand Forks Environmental Flight prior to any renovation commencing.

3.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the drawings and specifications. Prior to the beginning of any construction, the Contractor shall identify any land resources to be preserved within the work area. Except in areas indicated on the drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, topsoil, and land forms without approval. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. The Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs. Stone, soil, or other materials displaced into uncleared areas shall be removed by

the Contractor.

3.2.1 Work Area Limits

Prior to commencing construction activities, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are not to be disturbed shall be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, any markers shall be visible in the dark. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

3.2.2 Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques. The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work area.

3.2.3 Erosion and Sediment Controls

The Contractor shall be responsible for providing erosion and sediment control measures in accordance with Federal, State, and local laws and regulations. The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's construction activities. The area of bare soil exposed at any one time by construction operations should be kept to a minimum. The Contractor shall construct or install temporary and permanent erosion and sediment control best management practices (BMPs) as indicated on the drawings and/or as specified in Section 01356 STORM WATER POLLUTION PREVENTION MEASURES. BMPs may include, but not be limited to, vegetation cover, stream bank stabilization, slope stabilization, silt fences, construction of terraces, interceptor channels, sediment traps, inlet and outfall protection, diversion channels, and sedimentation basins. The Contractor's best management practices shall be in accordance with NDRO2-0314 Grand Forks AFB North Dakota Pollutant Discharge Elimination System (NPDES) Industrial Storm Water Permit including Grand Forks AFB's Storm Water Pollution Prevention Plan (SWPPP) that may be reviewed at the Grand Forks AFB's Environmental Office. Any temporary measures shall be removed after the area has been stabilized.

3.2.4 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed in areas designated on the drawings or as directed by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only when approved. Erosion and sediment controls shall be provided for on-site borrow and spoil areas to prevent sediment from entering nearby waters. Temporary excavation and embankments for plant and/or work areas shall be controlled to protect adjacent areas.

3.3 WATER RESOURCES

The Contractor shall monitor construction activities to prevent pollution of surface and ground waters. Toxic or hazardous chemicals shall not be

applied to soil or vegetation unless otherwise indicated. All water areas affected by construction activities shall be monitored by the Contractor. For construction activities immediately adjacent to impaired surface waters, the Contractor shall be capable of quantifying sediment or pollutant loading to that surface water when required by State or Federally issued Clean Water Act permits.

3.3.1 Wetlands

The Contractor shall not enter, disturb, destroy, or allow discharge of contaminants into any wetlands.

3.4 AIR RESOURCES

Equipment operation, activities, or processes performed by the Contractor shall be in accordance with all Federal and State air emission and performance laws and standards.

3.4.1 Particulates

Dust particles; aerosols and gaseous by-products from construction activities; and processing and preparation of materials, such as from asphaltic batch plants; shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall comply with North Dakota Administration Code 33-15-17 Restriction of Fugitive Emissions. The Contractor shall maintain excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the Federal, State, and local air pollution standards to be exceeded or which would cause a hazard or a nuisance. Sprinkling, chemical treatment of an approved type, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, competent equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. The Contractor shall comply with all State and local visibility regulations.

3.4.2 Odors

Odors from construction activities shall be controlled at all times. The odors shall not cause a health hazard and shall be in compliance with State regulations and/or local ordinances.

3.4.3 Sound Intrusions

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The Contractor shall comply with the provisions of the State of North Dakota's rules.

3.4.4 Burning

Burning shall be prohibited on the Government premises.

3.5 MANAGEMENT AND DISPOSAL OF WASTE AND CHEMICAL MATERIALS

Management and disposal of wastes and chemical materials shall be as directed below, unless otherwise specified in other sections and/or shown

on the drawings.

3.5.1 Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. Handling, storage, and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. The Contractor shall transport solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal. A Subtitle D RCRA permitted landfill shall be the minimum acceptable off-site solid waste disposal option. The Contractor shall verify that the selected transporters and disposal facilities have the necessary permits and licenses to operate.

3.5.2 Chemicals and Chemical Wastes

Chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. This documentation will be periodically reviewed by the Government. Chemical waste shall be collected in corrosion resistant, compatible containers. Collection drums shall be monitored and removed to a staging or storage area when contents are within 6 inches of the top. Wastes shall be classified, managed, stored, and disposed of in accordance with Federal, State, and local laws and regulations.

3.5.3 Contractor Generated Hazardous Wastes/Excess Hazardous Materials

Hazardous wastes are defined in 40 CFR 261, or are as defined by applicable State and local regulations. Hazardous materials are defined in 49 CFR 171 - 178. The Contractor shall, at a minimum, manage and store hazardous waste in compliance with 40 CFR 262. The Contractor shall take sufficient measures to prevent spillage of hazardous and toxic materials during dispensing. Hazardous Waste shall not be dumped onto the ground, into storm sewers, onto open water courses, or into the sanitary sewer system. The Contractor shall segregate hazardous waste from other materials and wastes, shall protect it from the weather by placing it in a safe covered location, and shall take precautionary measures such as berming or other appropriate measures against accidental spillage. The Contractor shall be responsible for storage, describing, packaging, labeling, marking, and placarding of hazardous waste and hazardous material in accordance with 49 CFR 171 - 178, State, and local laws and regulations.

Spills of hazardous or toxic materials shall be immediately reported to the Contracting Officer and the Facility Environmental Flight. Cleanup and cleanup costs due to spills shall be the Contractor's responsibility. Grand Forks AFB (GRFAFB) is a large quantity generator of hazardous waste. All hazardous waste generated on GFAFB shall be managed in accordance with Large Generator of Hazardous Standards as specified in 40 CFR 262. All hazardous waste generated on GRAFB shall be managed and coordinated with GRAFB 319 CES/CEVP, Environmental Flight, and the Contracting Officer. The Contractor shall:

- a. dispose of all hazardous waste through GRAFB 319 CES/CEVP, Environmental Flight in compliance with all Federal, State, and local laws and regulations unless the Contractor obtains a waiver from GFAFB 319 CES/CEVP, Environmental Flight, Installation Commander, HQ/AMC, HQ USAF/CEV, and the Contracting Officer to use another hazardous waste hauler or disposal company. All waiver

requests shall be coordinated through the Contracting Officer.

b. comply with all applicable requirements in the 319 ARW 7042-97 Hazardous Waste Management Plan, HWPM, that may be reviewed at the GFAFB Environmental Flight. The HWPM covers the procedures that the Contractor shall follow to accumulate, store, and turn-in hazardous waste on GFAFB.

c. notify GFAFB 319 CES/CEVP, Environmental Flight of all hazardous waste accumulation to arrange for periodic inspection.

d. use new/unused performance oriented tested containers that are marked with appropriate information showing conformance to the United Nations (UN) Standard.

e. accumulated no more than 55 gallons of any one hazardous waste stream at a time. Once the 55 gallon limit has been reached, the container shall be labeled with the date that the container was filled and shall be labeled with the contents of the container. The container shall be transported to a 90-day accumulation site within three days of the date the container was filled.

3.5.4 Fuel and Lubricants

Storage, fueling and lubrication of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spill and evaporation. Fuel, lubricants and oil shall be managed and stored in accordance with all Federal, State, Regional, and local laws and regulations. Used lubricants and used oil to be discarded shall be stored in marked corrosion-resistant containers and recycled or disposed in accordance with 40 CFR 279, State, and local laws and regulations. There shall be no storage of fuel on the project site. Fuel must be brought to the project site each day that work is performed.

3.5.5 Waste Water

Disposal of waste water shall be as specified below.

- a. Waste water from construction activities, such as onsite material processing, concrete curing, foundation and concrete clean-up, water used in concrete trucks, forms, etc. shall not be allowed to enter water ways or to be discharged prior to being treated to remove pollutants. The Contractor shall dispose of the construction related waste water off-Government property in accordance with all Federal, State, Regional and Local laws and regulations.
- b. For discharge of ground water, the Contractor shall obtain coverage under the State of North Dakota's General Permit specific for pumping and dewatering activities prior to surface discharging. The Contractor shall be responsible for assuring that all discharge of water shall be in accordance with all Federal, State, Regional and local laws and regulations.
- c. For water generated from the disinfection and hydrostatic testing of the domestic water and sewer lines including firewater lines, the Contractor shall discharge the waste water into the sanitary sewer with prior approval and/or notification to the Waste Water Treatment Plant's Operator.

- d. For water generated from hydrostatic testing the new above and under ground storage tanks, the Contractor shall obtain coverage under the State of North Dakota Hydrostatic Testing General permit and shall discharge the water in accordance with all Federal, State, and local laws and regulations.

3.6 RECYCLING AND WASTE MINIMIZATION

The Contractor shall participate in State and local government sponsored recycling programs. The Contractor is encouraged to minimize solid waste generation throughout the duration of the project. The Contractor shall contact GFAFB 319 CES/CEV Environmental Flight for the current recycling and waste minimization requirements for the base. See attached RECYCLING OPPORTUNITIES FOR INDUSTRIAL FACILITIES and ADDITIONAL RECYCLING OPPORTUNITIES for current instructions and recycling opportunities available on GFAFB.

3.7 NON-HAZARDOUS SOLID WASTE DIVERSION REPORT

The Contractor shall maintain an inventory of non-hazardous solid waste diversion and disposal of construction and demolition debris. The Contractor shall submit a report to Grand Forks AFB Environmental Flight through the Contracting Officer on the first working day after each fiscal year quarter, starting the first quarter that non-hazardous solid waste has been generated. The following shall be included in the report:

- a. Construction and Demolition (C&D) Debris Disposed = _____ in cubic yards or tons, as appropriate.
- b. Construction and Demolition (C&D) Debris Recycled = _____ in cubic yards or tons, as appropriate.
- c. Total C&D Debris Generated = _____ in cubic yards or tons, as appropriate.
- d. Waste Sent to Waste-To-Energy Incineration Plant (This amount should not be included in the recycled amount) = _____ in cubic yards or tons, as appropriate.

3.8 HISTORICAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

If during excavation or other construction activities any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the Contracting Officer so that the appropriate authorities may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made. The Contractor shall cease all activities that may result in impact to or the destruction of these resources. The Contractor shall secure the area and prevent Contractor personnel or other persons from trespassing on, removing, or otherwise disturbing such resources.

3.9 BIOLOGICAL RESOURCES

The Contractor shall minimize interference with, disturbance to, and damage to fish, wildlife, and plants including their habitat. The Contractor shall be responsible for the protection of threatened and endangered animal and plant species including their habitat in accordance with Federal, State, Regional, and local laws and regulations.

3.10 INTEGRATED PEST MANAGEMENT

In order to minimize impacts to existing fauna and flora, the Contractor, through the Contracting Officer, shall coordinate with the Installation Pest Management Coordinator (IPMC) at the earliest possible time prior to pesticide application. The Contractor shall discuss integrated pest management strategies with the IPMC and receive concurrence from the IPMC through the COR prior to the application of any pesticide associated with these specifications. Installation Pest Management personnel shall be given the opportunity to be present at all meetings concerning treatment measures for pest or disease control and during application of the pesticide. The use and management of pesticides are regulated under 40 CFR 152 - 186.

3.10.1 Pesticide Delivery and Storage

Pesticides shall be delivered to the site in the original, unopened containers bearing legible labels indicating the EPA registration number and the manufacturer's registered uses. Pesticides shall be stored according to manufacturer's instructions and under lock and key when unattended.

3.10.2 Qualifications

For the application of pesticides, the Contractor shall use the services of a subcontractor whose principal business is pest control. The subcontractor shall be licensed and certified in the state where the work is to be performed.

3.10.3 Pesticide Handling Requirements

The Contractor shall formulate, treat with, and dispose of pesticides and associated containers in accordance with label directions and shall use the clothing and personal protective equipment specified on the labeling for use during all phases of the application. Material Safety Data Sheets (MSDS) shall be available for all pesticide products.

3.10.4 Application

Pesticides shall be applied by a State Certified Pesticide Applicator in accordance with EPA label restrictions and recommendation. The Certified Applicator shall wear clothing and personal protective equipment as specified on the pesticide label. Water used for formulating shall only come from locations designated by the Contracting Officer. The Contractor shall not allow the equipment to overflow. Prior to application of pesticide, all equipment shall be inspected for leaks, clogging, wear, or damage and shall be repaired prior to being used.

3.11 PREVIOUSLY USED EQUIPMENT

The Contractor shall clean all previously used construction equipment prior to bringing it onto the project site. The Contractor shall ensure that the

equipment is free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements.

3.12 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain permanent and temporary pollution control facilities and devices for the duration of the contract or for that length of time construction activities create the particular pollutant.

3.13 MILITARY MUNITIONS

In the event the Contractor discovers or uncovers military munitions as defined in 40 CFR 260, the Contractor shall immediately stop work in that area and immediately inform the Contracting Officer.

3.14 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection and pollution control. The Contractor shall conduct environmental protection/pollution control meetings for all Contractor personnel prior to commencing construction activities. Additional meetings shall be conducted for new personnel and when site conditions change. The training and meeting agenda shall include: methods of detecting and avoiding pollution; familiarization with statutory and contractual pollution standards; installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental protection/pollution control; anticipated hazardous or toxic chemicals or wastes, and other regulated contaminants; recognition and protection of archaeological sites, artifacts, wetlands, and endangered species and their habitat that are known to be in the area.

3.15 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction in accordance with Contract Clause: "Cleaning Up". The Contractor shall, unless otherwise instructed in writing by the Contracting Officer, obliterate all signs of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. The disturbed area shall be graded, filled and the entire area seeded unless otherwise indicated.

-- End of Section --

This page was intentionally left blank for duplex printing.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01400

SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND RENOVATION

05/00 Rev 12/01

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUMMARY
 - 1.2.1 General
- 1.3 PRECONSTRUCTION CONFERENCE
- 1.4 SUBMITTALS
- 1.5 ACCIDENT PREVENTION PLAN
 - 1.5.1 Requirements
 - 1.5.1.1 Responsible Individual(s)
 - 1.5.1.2 Subcontractor Supervision
 - 1.5.1.3 Indoctrination of New Employees
 - 1.5.1.4 Tool Box Safety Meetings
 - 1.5.1.5 Fire Prevention and Protection
 - 1.5.1.6 Housekeeping
 - 1.5.1.7 Mechanical Equipment Inspection
 - 1.5.1.8 First Aid and Medical Facilities
 - 1.5.1.9 Sanitation
 - 1.5.1.10 Safety Promotions
 - 1.5.1.11 Accident Reporting
 - 1.5.1.12 Job Hazard Analysis
- 1.6 RADIOLOGICAL EQUIPMENT
- 1.7 NOT USED
- 1.8 EXCAVATION AND TRENCHING
- 1.9 ASBESTOS AND LEAD PAINT
 - 1.9.1 Safety Plans
 - 1.9.2 Safety and Health Oversight
 - 1.9.3 Qualifications
 - 1.9.3.1 Competent Person
 - 1.9.3.2 Testing Laboratory
 - 1.9.4 Exposure Assessment
 - 1.9.4.1 Asbestos
 - 1.9.4.2 Lead Paint
 - 1.9.5 Employee Protection
 - 1.9.5.1 Respiratory Protection Program
 - 1.9.5.2 Protective Equipment
 - 1.9.5.3 Decontamination Areas
 - 1.9.5.4 Handwashing Facilities
 - 1.9.5.5 Medical Surveillance
 - 1.9.5.6 Training
 - 1.9.6 Engineering Controls

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section Table of Contents --

SECTION 01400

SPECIAL SAFETY REQUIREMENTS FOR DEMOLITION AND RENOVATION
05/00 Rev 12/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 763	Asbestos

ENGINEERING MANUALS (EM)

EM 385-1-1	(1996 and Changes) Safety and Health Requirements Manual
------------	--

1.2 SUMMARY

1.2.1 General

This section provides guidelines for preparation of accident prevention plans, and to implement the accident prevention clause (this specification) and EM 385-1-1, Safety and Health Requirements Manual. This section also includes guidelines for demolition and renovation of structures that contain nonfriable (i.e. NESHAP Category I) asbestos or lead-based paint, and that are to be demolished or renovated with these materials in place. The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1 is available from U.S. Government bookstores operated by the Government Printing Office and a copy is included on the CD-ROM issued with this solicitation. Changes to EM 385-1-1 applicable to this contract include only those revisions posted at the following website (all revisions up to the time this solicitation is issued): http://www.hq.usace.army.mil/soh/hqusace_soh.htm ("Changes to EM"). U.S. Government bookstores are located in most major cities including Milwaukee, Chicago, Kansas City, Denver, and Pueblo, Colorado.

1.3 PRECONSTRUCTION CONFERENCE

See Contract Clause "PRECONSTRUCTION CONFERENCE". A preconstruction conference will be scheduled prior to beginning of site work. Requirements relative to planning and administration of the overall safety program will be discussed.

1.4 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan; G-RE

The written site-specific Accident Prevention Plan including sections for lead and asbestos.

Respiratory Protection Program; G-RE.

Records of the respirator program.

SD-06 Test Reports

Exposure Assessment and Air Monitoring; G-RE.

Initial exposure assessments, negative exposure assessments, air-monitoring results and documentation.

SD-07 Certificates

Qualifications; G-RE.

A written report providing evidence of qualifications for personnel, facilities and equipment assigned to the work. Include copies of 3.

- a. Current AHERA Accreditation certificates, per AHERA Regulation 40 CFR 763, Appendix C to Subpart E, for each worker or supervisor; Current State and Local supervisor and worker accreditation certificates.
- b. Laboratory Qualifications and Certificates

Training Program;

A copy of the written project site-specific training material as indicated in 29 CFR 1926, Section .1101 that will be used to train onsite employees. The training document shall be signed by the Contractor's Competent Person.

Medical Requirements.

Physician's written opinion.

1.5 ACCIDENT PREVENTION PLAN

The Contractor shall submit, prior to the start of on site construction activity, a proposed accident prevention plan which shall be the accident prevention policy to be followed by all of the Contractor's and subcontractor's personnel and supervisory staff during performance of the work.

1.5.1 Requirements

The proposed plan shall be developed after a careful analysis of the work involved and shall be tailored specifically to the conditions of this project and shall include, as separate sections, a lead safety plan and an asbestos safety plan as described in Paragraph: Safety Plans. The Contractor's accident prevention plan shall also contain, as a minimum, the following general information or procedures for the activity indicated. The Contractor shall submit his plan for review and acceptance prior to commencing work.

1.5.1.1 Responsible Individual(s)

The Contractor shall designate an onsite employee as the individual responsible for insuring the accident prevention plan is implemented and enforced.

1.5.1.2 Subcontractor Supervision

Explain procedures to assure that subcontractor(s) fully comply with the accident prevention plan.

1.5.1.3 Indoctrination of New Employees

The plan shall include provisions for advising workers of the purpose of the accident prevention plan, specific hazards on the job and precautions to be taken, emergency procedures, information concerning tool box safety meetings, required protective equipment, cleanup rules and location of company safety rules (posting or handout).

1.5.1.4 Tool Box Safety Meetings

Hold weekly "Tool Box" safety meetings. Timely safety subjects shall be determined by a responsible individual. Employees will be informed of time, location, who will conduct, and subject. Identify procedures for including subcontractors. The Contractor shall provide a copy of the Weekly Tool Box Meeting and Monthly Supervisor's Safety Meeting to the Contracting Officer.

1.5.1.5 Fire Prevention and Protection

Identify source of fire protection. Insure adequate fire extinguishers, water barrels, or other fire-fighting equipment is located on site. Explain prevention activities to include storage areas and special hazards such as welding and use of flammable liquids, and other special hazards.

1.5.1.6 Housekeeping

Daily cleanup of all debris and waste materials is required. Adequate disposal containers should be placed strategically around the site. Debris shall be removed on a regular basis. Explain procedures that include use of barrels, dumpsters, trash chutes, etc.

1.5.1.7 Mechanical Equipment Inspection

All mechanical equipment (trucks, cranes, forklifts, backhoes, graders, etc.) shall be inspected prior to use and at fixed intervals throughout the life of the contract. Explain how inspections will be accomplished (frequency, by whom, and records to be kept).

1.5.1.8 First Aid and Medical Facilities

First aid facilities shall be made available on the job site. Arrangements for emergency medical attention shall be made prior to start of work. All emergency numbers (doctor, hospital, ambulance, fire department) shall be posted at the project superintendent's office.

1.5.1.9 Sanitation

Include provisions for toilet facilities, drinking water and washing facilities. A sufficient number of toilet facilities as specified in EM 385-1-1 shall be provided unless permission is granted to use existing facilities (portable chemical are authorized). Insure safe drinking water and individual cups are available. For the projects where corrosive or toxic materials are used, separate washing facilities are required.

1.5.1.10 Safety Promotions

The Contractor shall promote accident prevention. Identify method (posters, awards etc.).

1.5.1.11 Accident Reporting

All accidents (employee injuries, vehicle, building, or equipment damage etc.) regardless of their severity, shall be reported to the onsite government representative or to the area engineer, who in turn will advise the Contractor of forms to be submitted and timeframes.

1.5.1.12 Job Hazard Analysis

When job situations change and it is necessary to alter safety requirements, a Job Hazard Analysis will be accomplished, documented, and added as an addendum to the Accident Prevention Plan. Each Job Hazard Analysis shall include, but not be limited to, a description of the work, probable hazards related to that work and positive precautionary measures to be taken to reduce or eliminate each hazard. An example of changing situations may be new subcontractors performing work such as earth moving, trenching, concrete work, roofing, electrical, masonry etc. The onsite government representative will determine the format and amount of detail required of the written plan.

1.6 RADIOLOGICAL EQUIPMENT

In addition to any applicable Nuclear Regulatory Commission, state, local, or other federal licenses or permits, and in accordance with requirements of EM 385-1-1, Safety and Health Requirement Manual, the Contractor is required to obtain a service permit to use, store, operate, or handle a radiation producing machine or radioactive materials on a Department of Defense (DOD) Installation. The service permit shall be obtained from the appropriate U.S. Army or U.S. Air Force Command through the Contracting Officer's representative. The Contractor should notify the Contracting Officer during the prework conference if a radiation producing device will be utilized on a DOD Installation in order to determine the permit application requirements, and allow a lead time of 45 days for obtaining a permit.

1.7 NOT USED

1.8 EXCAVATION AND TRENCHING

The standards for excavation and trenching are outlined in 29 CFR 1926, Subpart P. These standards shall be followed in addition to those outlined in EM 385-1-1.

1.9 ASBESTOS AND LEAD PAINT

1.9.1 Safety Plans

The accident prevention plan shall contain distinct sections entitled Lead Safety Plan and Asbestos Safety Plan. Each section will address the following topics: qualifications of the competent person, laboratory qualifications, personal air monitoring, exposure assessment, work practices for specific Class II asbestos activities, engineering controls to reduce exposure, personal protection equipment, respiratory protection program, hygiene facilities and practices, medical surveillance, employee training, housekeeping, and waste containerization, labeling and disposal,

1.9.2 Safety and Health Oversight

Work which may expose personnel to asbestos and lead paint shall be supervised by a Competent Person as defined in 29 CFR 1926.1101 and 29 CFR 1926.62 and as required in paragraph: Qualifications of this section. The Competent Person shall be able to identify existing and predictable asbestos and lead paint hazards and shall have the authority to take corrective measures to eliminate them. Personal air monitoring shall be overseen by the Competent Person.

1.9.3 Qualifications

1.9.3.1 Competent Person

a. Asbestos

The Contractor's full-time onsite Competent Person shall meet the competent person requirements of 29 CFR 1926 Section .1101 and shall have completed the EPA Model Accreditation Plan (MAP) "Contractor/Supervisor" training accreditation required by 40 CFR 763, Subpart E, Appendix C. The Competent Person shall be experienced in the administration and supervision of asbestos abatement projects, including exposure assessment and monitoring, work practices, protective measures for personnel, setting up and inspecting asbestos abatement work areas, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, site safety and health requirements, etc. and have had a minimum of 2 years on-the-job experience.

b. Lead Paint

The Contractor's full-time onsite Competent Person shall meet the competent person requirements of 29 CFR 1926 Section .62 and be experienced in administration and supervision of projects involving lead-based paint, including work practices, protective measures for personnel, etc. This person shall have completed a Contractor Supervisor LBP abatement course by an EPA Training Center or an equivalent certification course, and have had a minimum of 2 years on-the-job experience.

1.9.3.2 Testing Laboratory

a. Asbestos

The Contractor shall provide the name, address and telephone number of the independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by federal, state or local regulations. Written verification, signed by the testing laboratory principal and the Contractor, that the laboratory is fully equipped and proficient in conducting PCM of airborne samples using the methods specified by 29 CFR 1926, Section .1101, OSHA method ID-160, and the most current version of NIOSH Pub No. 84-100 Method 7400. Evidence that the laboratory is currently judged proficient (classified as acceptable) in counting airborne asbestos samples by PCM by successful participation in each of the last 4 rounds in the American Industrial Hygiene Association (AIHA) shall be submitted.

b. Lead Paint

The laboratory performing the analysis shall be an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and be rated proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT). Currently, the American Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors.

1.9.4 Exposure Assessment

1.9.4.1 Asbestos

a. Initial Exposure Assessment

The Contractor's Competent Person shall conduct an exposure assessment immediately before or at the initiation of an asbestos abatement operation to ascertain expected exposures during that operation. The assessment shall be completed in time to comply with the requirements which are triggered by exposure data or the lack of a negative exposure assessment, and to provide information necessary to assure that all control systems planned are appropriate for that operation. The assessment shall take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job.

b. Negative Exposure Assessment

The Contractor may provide a negative exposure assessment for the specific asbestos job covered by this Specification Section. When provided, the Negative Exposure Assessment shall be based on one or more of the following criteria:

(1) Objective Data: Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the PEL-TWA and PEL-Excursion Limit under those work conditions having the greatest potential for releasing asbestos.

(2) Prior Asbestos Jobs: Where the Contractor has monitored prior

asbestos jobs for the PEL and the PEL-Excursion Limit within 12 months of the current job, the monitoring and analysis were performed in compliance with asbestos standard in effect; the data were obtained during work operations conducted under workplace conditions closely resembling the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations; the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job; and these data show that under the conditions prevailing and which will prevail in the current workplace, there is a high degree of certainty that the monitoring covered exposure from employee exposures will not exceed the PEL-TWA and PEL-Excursion Limit.

(3) Initial Exposure Monitoring: The results of initial exposure monitoring of the current job, made from breathing zone air samples that are representative of the 8-hour PEL-TWA and 30-minute short-term exposures of each employee. The monitoring covered exposure from operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

1.9.4.2 Lead Paint

For personnel who may be exposed to dust resulting from demolition or removal of painted surfaces, the Contractor is required to perform an exposure assessment to determine personnel exposure levels to lead. This assessment shall consist of personal air monitoring representative of a full shift. Airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR 1926 Section .62. Results shall be reported in micrograms per cubic meter of air. The Competent Person shall use personal air monitoring results to determine the effectiveness of engineering controls, the adequacy of PPE and to determine if proper work practices are being employed. The Contracting Officer shall be notified if any personal air monitoring result equals or exceeds 30 micrograms per cubic meter of air. The Contractor shall take steps to reduce the concentration of lead in the air. If results are obtained indicating employee exposure below the action level for lead (30 ug/m³) the Competent Person may recommend to the Contracting Officer, in writing, appropriate reductions in employee protection. Alternatively, as determined by the Competent Person, where the Contractor has previously monitored for lead exposures within the past 12 months during work operations conducted under workplace conditions closely resembling the processes, type of materials, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations, the Contractor may, upon approval of the Contracting Officer, use this data in making the initial determination of employee exposure.

1.9.5 Employee Protection

Until monitoring results are received which document that the employee is not exposed above the action level for asbestos or lead, the Contractor shall implement employee protective measures as listed below:

1.9.5.1 Respiratory Protection Program

A respiratory protection program shall be established as required by 29 CFR 1926 Section .103, .1101 and .62 and in accordance with 29 CFR 1910 Section .134. A NIOSH-approved respirator and cartridges appropriate to the job, as determined by the Competent Person, shall be furnished to each employee

and visitor potentially exposed to airborne asbestos or lead. A fit test shall be conducted in accordance with applicable sections of 29 CFR 1926.

1.9.5.2 Protective Equipment

The Contractor shall furnish, at no cost to personnel, equipment/clothing for protection from airborne and waterborne asbestos and LBP debris. An adequate supply of disposable full-body coveralls, steel toe/shank boots with nonskid soles or impermeable work boot covers, gloves, hard hats and eye protection shall be worn by workers in regulated work areas. Employees shall be instructed in appropriate practices for donning and removing protective equipment. Protective clothing and equipment shall not be removed from the work site at any time.

1.9.5.3 Decontamination Areas

The employer shall establish a decontamination area that is adjacent to the regulated area for the decontamination of employees and their equipment which is contaminated with asbestos. The decontamination area shall be a designated area shall be covered by an impermeable drop cloth and shall be of sufficient size to accommodate cleaning of equipment and for removing personal protective equipment without spreading contamination beyond the area. The decontamination area shall be established in a manner such that employees must enter and exit the decontamination area through the equipment drop area. Work clothing, must be HEPA vacuumed before it is removed. Equipment and other surfaces shall be cleaned prior to removing the items from the decontamination area. To prevent cross-contamination, the employer shall provide storage facilities for protective work clothing and equipment that are segregated from storage areas for street clothes and non-contaminated equipment. The employer shall also assure that employees do not leave the workplace wearing any protective clothing or equipment that is required to be worn during the work shift.

1.9.5.4 Handwashing Facilities

The employer shall provide adequate handwashing facilities for use by employees in accordance with 29 CFR 1926.51(f) and shall assure that employees wash their hands and face at the end of the work-shift.

1.9.5.5 Medical Surveillance

a. Asbestos

Before being exposed to airborne asbestos fibers, workers shall be provided with a medical examination as required by 29 CFR 1926, Section .1101(m) and other pertinent state or local requirements. This requirement shall have been satisfied within the last 12 months. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

b. Lead Paint

Medical surveillance for lead shall comply with the requirements of 29 CFR 1926 Section 62(j) and other pertinent state or local requirements. Analysis for blood lead and zinc protoporphyrin levels shall be included in the examination portion of the medical surveillance program.

1.9.5.6 Training

a. Asbestos

Workers conducting Class II asbestos work shall be provided training prior to the time of job assignment and, at least, annually. Training shall include, at a minimum the elements specified in 29 CFR 1926 Section .1101(k)(9) "Employee Information and Training".

b. Lead Paint

Workers potentially exposed to lead-contaminated dust shall be provided training regarding lead hazards prior to the time of job assignment and, at least, annually. Training shall include, at a minimum the elements specified in 29 CFR 1926 Section .62(l) "Employee Information and Training".

1.9.6 Engineering Controls

Engineering controls shall be employed to maintain the integrity of the asbestos material and lead paint and to minimize the potential for release of asbestos fibers or generation of lead-containing dust. Asbestos-containing materials shall not be cut, ground, abraded or handled in any other manner that may render the material friable as described in 40 CFR 61, Subpart M and OSHA 29 CFR 1926.1101. The contractor shall describe proposed engineering control methods and practices in the lead safety and asbestos safety portions of the accident prevention plan.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

-- End of Section --

This page was intentionally left blank for duplex printing.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01451A

CONTRACTOR QUALITY CONTROL

07/01; Omaha Rev. 10/01

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 PAYMENT

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

- 3.1 GENERAL REQUIREMENTS
- 3.2 QUALITY CONTROL PLAN
 - 3.2.1 Content of the CQC Plan
 - 3.2.2 Acceptance of Plan
 - 3.2.3 Notification of Changes
- 3.3 COORDINATION MEETING
- 3.4 QUALITY CONTROL ORGANIZATION
 - 3.4.1 Personnel Requirements
 - 3.4.2 CQC System Manager
 - 3.4.3 CQC Personnel
 - 3.4.4 Not Used
 - 3.4.5 Organizational Changes
- 3.5 SUBMITTALS AND DELIVERABLES
- 3.6 CONTROL
 - 3.6.1 Preparatory Phase
 - 3.6.2 Initial Phase
 - 3.6.3 Follow-up Phase
 - 3.6.4 Additional Preparatory and Initial Phases
- 3.7 TESTS
 - 3.7.1 Testing Procedure
 - 3.7.2 Testing Laboratories
 - 3.7.2.1 Capability Check
 - 3.7.2.2 Capability Recheck
 - 3.7.3 Onsite Laboratory
 - 3.7.4 Furnishing or Transportation of Samples for Testing
- 3.8 COMPLETION INSPECTION
 - 3.8.1 Punch-Out Inspection
 - 3.8.2 Pre-Final Inspection
 - 3.8.3 Final Acceptance Inspection
- 3.9 DOCUMENTATION
- 3.10 SAMPLE FORMS
- 3.11 NOTIFICATION OF NONCOMPLIANCE

-- End of Section Table of Contents --

SECTION 01451A

CONTRACTOR QUALITY CONTROL
07/01; Omaha Rev. 10/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740	(2001) Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
ASTM E 329	(2000b) Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause titled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The site project superintendent will be held responsible for the quality of work on the job and is subject to removal by the Contracting Officer for non-compliance with the quality requirements specified in the contract. The site project superintendent in this context shall be the highest level manager responsible for the overall construction activities at the site, including quality and production. The site project superintendent shall maintain a physical presence at the site at all times, except as otherwise acceptable to the Contracting Officer, and shall be responsible for all construction and construction related activities at the site.

3.2 QUALITY CONTROL PLAN

The Contractor shall furnish for review by the Government, not later than 10 days after receipt of notice to proceed, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause titled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, tests, records, and forms to be used. The Government will consider an interim plan for the first 30 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.1 Content of the CQC Plan

The CQC Plan shall include, as a minimum, the following to cover all construction operations, both onsite and offsite, including work by subcontractors, fabricators, suppliers, and purchasing agents:

- a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the project superintendent.
- b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.
- c. A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters shall also be furnished to the Government.
- d. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, offsite fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with Section 01330 SUBMITTAL PROCEDURES.
- e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, and person responsible for each test. (Laboratory facilities will be approved by the Contracting Officer.)
- f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.
- g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures shall establish verification that identified

deficiencies have been corrected.

- h. Reporting procedures, including proposed reporting formats.
- i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks, has separate control requirements, and may be identified by different trades or disciplines, or it may be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable features under a particular section. This list will be agreed upon during the coordination meeting.

3.2.2 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC Plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.3 Notification of Changes

After acceptance of the CQC Plan, the Contractor shall notify the Contracting Officer in writing of any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the CQC Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. The CQC Plan shall be submitted for review a minimum of 10 calendar days prior to the Coordination Meeting.

During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording the CQC operations, control activities, testing, administration of the system for both onsite and offsite work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 Personnel Requirements

The requirements for the CQC organization are a CQC System Manager and sufficient number of additional qualified personnel to ensure safety and contract compliance. The Safety and Health Manager shall receive direction and authority from the CQC System Manager and shall serve as a member of the CQC staff. Personnel identified in the technical provisions as requiring specialized skills to assure the required work is being performed properly will also be included as part of the CQC organization. The

Contractor's CQC staff shall maintain a presence at the site at all times during progress of the work and have complete authority and responsibility to take any action necessary to ensure contract compliance. The CQC staff shall be subject to acceptance by the Contracting Officer. The Contractor shall provide adequate office space, filing systems and other resources as necessary to maintain an effective and fully functional CQC organization. Complete records of all letters, material submittals, show drawing submittals, schedules and all other project documentation shall be promptly furnished to the CQC organization by the Contractor. The CQC organization shall be responsible to maintain these documents and records at the site at all times, except as otherwise acceptable to the Contracting Officer.

3.4.2 CQC System Manager

The Contractor shall identify as CQC System Manager an individual within the onsite work organization who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. The CQC System Manager shall be a construction person with a minimum of 5 years in related work. This CQC System Manager shall be on the site at all times during construction and shall be employed by the prime Contractor. The CQC System Manager shall be assigned as System Manager but may have duties as project superintendent in addition to quality control. An alternate for the CQC System Manager shall be identified in the plan to serve in the event of the System Manager's absence. The requirements for the alternate shall be the same as for the designated CQC System Manager.

3.4.3 CQC Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member.

3.4.4 Not Used

3.4.5 Organizational Changes

The Contractor shall maintain the CQC staff at full strength at all times. When it is necessary to make changes to the CQC staff, the Contractor shall revise the CQC Plan to reflect the changes and submit the changes to the Contracting Officer for acceptance.

3.5 SUBMITTALS AND DELIVERABLES

Submittals, if needed, shall be made as specified in Section 01330 SUBMITTAL PROCEDURES. The CQC organization shall be responsible for certifying that all submittals and deliverables are in compliance with the contract requirements. When Section 15950A HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTROL SYSTEMS; 15951A DIRECT DIGITAL CONTROL FOR HVAC; 15990A TESTING, ADJUSTING, AND BALANCING OF HVAC SYSTEMS; or 15995A COMMISSIONING OF HVAC SYSTEMS are included in the contract, the submittals required by those sections shall be coordinated with Section 01330 SUBMITTAL PROCEDURES to ensure adequate time is allowed for each type of submittal required.

3.6 CONTROL

Contractor Quality Control is the means by which the Contractor ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. At least three phases of control shall be conducted by the CQC System Manager for each definable feature of work as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work, after all required plans/documents/materials are approved/accepted, and after copies are at the work site. This phase shall include:

- a. A review of each paragraph of applicable specifications, reference codes, and standards. Prior to the preparatory meeting for each definable feature of work, the Contractor shall provide all technical references (i.e. building codes, life safety codes, etc.) referenced in the project specifications for feature(s) of work being addressed at the preparatory meeting. These technical references shall be onsite and available for use by Contractor and Government personnel before the preparatory meeting is held and maintained until the feature(s) of work is/are accepted by the Government.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. Review of provisions that have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for controlling quality of the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that feature of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. Discussion of the initial control phase.
- k. The Government shall be notified at least 48 hours in advance of beginning the preparatory control phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the

foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of work to ensure that it is in full compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verify adequacy of controls to ensure full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with required sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 48 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work onsite, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure control activities, including control testing, are providing continued compliance with contract requirements, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon nor conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases shall be conducted on the same definable features of work if: the quality of on-going work is unacceptable; if there are changes in the applicable CQC staff, onsite production supervision or work crew; if work on a definable feature is resumed after a substantial period of inactivity; or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Upon request, the Contractor shall furnish to the Government duplicate samples of test specimens for possible testing by the Government. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, shall be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test shall be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an offsite or commercial test facility shall be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing Laboratories

3.7.2.1 Capability Check

The Government reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.2 Capability Recheck

If the selected laboratory fails the capability check, the Contractor will be assessed the actual cost for the recheck to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor.

3.7.3 Onsite Laboratory

The Government reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests, and to check the

Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials shall be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered to the Corps of Engineers Division Laboratory, f.o.b., at the following address:

For delivery by mail: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

For other deliveries: Commander and Director
U.S. Army Engineer Waterways Experiment Station
Attn: CEWES-GS
3909 Hallsferry Road
Vicksburg, Mississippi 39180-6199

Coordination for each specific test, exact delivery location, and dates will be made through the Resident or Area (as directed) Office.

3.8 COMPLETION INSPECTION

3.8.1 Punch-Out Inspection

Near the end of the work, or any increment of the work established by a time stated in the Special Clause, "Commencement, Prosecution, and Completion of Work", or by the specifications, the CQC Manager shall conduct an inspection of the work. A punch list of items which do not conform to the approved drawings and specifications shall be prepared and included in the CQC documentation, as required by paragraph DOCUMENTATION. The list of deficiencies shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected.

Once this is accomplished, the Contractor shall notify the Government that the facility is ready for the Government Pre-Final inspection.

3.8.2 Pre-Final Inspection

The Government will perform the pre-final inspection to verify that the facility is complete and ready to be occupied. A Government Pre-Final Punch List may be developed as a result of this inspection. The Contractor's CQC System Manager shall ensure that all items on this list have been corrected before notifying the Government, so that a Final inspection with the customer can be scheduled. Any items noted on the Pre-Final inspection shall be corrected in a timely manner. These inspections and any deficiency corrections required by this paragraph shall be accomplished within the time slated for completion of the entire work or any particular increment of the work if the project is divided into increments by separate completion dates.

3.8.3 Final Acceptance Inspection

The Contractor's Quality Control Inspection personnel, plus the superintendent or other primary management person, and the Contracting Officer's Representative shall be in attendance at the final acceptance

inspection. Additional Government personnel including, but not limited to, those from Base/Post Civil Facility Engineer user groups, and major commands may also be in attendance. The final acceptance inspection will be formally scheduled by the Contracting Officer based upon results of the Pre-Final inspection. Notice shall be given to the Contracting Officer at least 14 days prior to the final acceptance inspection and shall include the Contractor's assurance that all specific items previously identified to the Contractor as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the final acceptance inspection. Failure of the Contractor to have all contract work acceptably complete for this inspection will be cause for the Contracting Officer to bill the Contractor for the Government's additional inspection cost in accordance with the contract clause titled "Inspection of Construction".

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of subcontractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase shall be identified (Preparatory, Initial, Follow-up). List of deficiencies noted, along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals and deliverables reviewed, with contract reference, by whom, and action taken.
- g. Offsite surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the

contract. The original and one copy of these records in report form shall be furnished to the Contracting Officer's Representative on the first day following the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality control personnel.

3.10 SAMPLE FORMS

Sample forms enclosed at the end of this section.

3.11 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the work site, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

(FIRM NAME)

DAILY QUALITY CONTROL REPORT

Daily Report No.:

DATE :

Contract No. _____

Project Title & Location:

Weather: _____ Precipitation: _____ in. _____ Temp: _____ Min. _____ Max. _____

1. Contract/Subcontractors and Area of Responsibility:

[illegible][illegible]

2. Operating Plant or Equipment. (Not hand tools)

Plant/Equipment	Date of Arrival/Departure	Date of Safety Check	Hours Used	Hours Idle	Hours Repair
-----------------	------------------------------	-------------------------	---------------	---------------	-----------------

[illegible]

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by NAS activity number).

4. Control Activities Performed:

Preparatory Inspections: (Identify feature of work and attach minutes).

Initial Inspections: (Identify feature of work and attach minutes).

Follow-Up Inspections: (List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted).

5. Tests Performed and Test Results: (Identify test requirement by paragraph number in specifications and/or sheet number in plans).

6. Material Received: (Note inspection results and storage provided).

7. Submittals Reviewed:

(a) Submittal No.	(b) Spec/Plan Reference	(c) By Whom	(d) Action
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

8. Offsite Surveillance Activities, Including Action Taken:

9. Job Safety: (List items checked, results, instructions and corrective actions taken).

10. Remarks: (Instructions received or given. Conflict(s) in Plans and/or specifications. Delays encountered.).

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

CQC System Manager

Date

-- End of Section --

SECTION 02060

ASBESTOS CONTAINING MATERIAL (ACM) REMOVAL AND DISPOSAL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This work does not consist of RACM abatement and disposal. The ACM within these buildings (wall board system and mastic) is not regulated and therefore does not need to be removed prior to demolition.

1.02 TEST RESULTS

- A. The sampling and laboratory test results from ARC Laboratories (Asbestos and Lead Paint Inspection Report) are a part of this specification.

1.03 COMPLIANCE WITH REGULATIONS

- A. The contractor shall comply with all applicable Federal, state and local regulations in the performance of this work. Where a conflict exists, follow the most stringent requirement.
- B. Applicable regulations shall include and are not limited to:
 - 1. Code of Federal Regulations (CFR):
 - a. 29 CFR 1910.1001 Asbestos
 - b. 29 CFR 1910.1200 Hazard Communication
 - c. 29 CFR 1910.134 Respiratory Protection
 - d. 29 CFR 1910.141 Shower Rooms
 - e. 29 CFR 1910.145 Specification for Accident Prevention Signs and Tags
 - f. 29 CFR 1910.20 Access to Employee Exposure and Medical Records
 - g. 29 CFR 1926.1101 Asbestos
 - h. 40 CFR 61, Subpart A General Provisions
 - i. 40 CFR 61, Subpart M National Emission Standard for Asbestos
 - 2. American National Standards Institute (ANSI):
 - a. 29.2 Fundamental Standard Covering the Design and Operation of Exhaust Systems
 - b. Z88.2 Respiratory Protection and Practice
 - 3. North Dakota Dept. of Health:
 - a. NDAC Chapter 33-15-13: Emission Standards for Hazardous Air Pollutants

1.04 MANIFESTS

- A. The contractor shall prepare, execute and track all Waste Shipment Records. The preparation of Waste Shipment Records shall be coordinated with GFAFB 319 CES/CEVC.

PART 2 – PRODUCTS

Products discussion is included in PART 1 GENERAL.

PART 3 – EXECUTION

3.01 GENERAL

- A. Conduct all work in accordance with the approved ACM Removal and Disposal Plan.

3.02 CONTAINMENT

- A. Erect appropriate containment and post signs to preclude general traffic flow.
- B. Provide appropriate work signage, warning lights and barrier tape.

3.03 ACM REMOVAL AND DISPOSAL

- A. If the Contractor encounters levels of asbestos in excess of the specified respective limits, the Contractor shall stop work, and contact the Contracting Officer immediately.
- B. Keep dust in the work areas to a minimum. The contractor shall remove all dust and contaminants from the work areas resulting from his operations.
- C. Inform Contracting Officer of air monitoring results and unusual conditions.
- D. Store and dispose of waste properly. Keep work areas in an orderly and safe manner.

3.04 RECORDS

- A. Keep project records for a minimum of three years for all monitoring, sampling and laboratory testing. Include the date, number, duration and location of each sample taken, methods used, and results. Submit two copies of project records to Contracting Officer at completion of the work.

- B. The Contracting Officer may request the submittal of specific records and testing results during the course of the project. The requested information shall be submitted within five working days.
- C. Keep and maintain medical surveillance records before, during and after the work of this project.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 02061

LEAD BASED PAINT (LBP) REMOVAL AND DISPOSAL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. This work does not consist of lead-based paint (LBP) abatement from various building components. The work does, however, consist of the removal or demolition of various building components that are coated with LBP. The various component that are LBP coated are the following:

1. Garage door wood trim.
2. Basement steel column and beam paint.

1.02 TEST RESULTS

- A. The sampling and laboratory test results from ARC Laboratories (Asbestos and Lead Paint Inspection Report) are a part of this specification.

1.03 COMPLIANCE WITH REGULATIONS

- A. The contractor shall comply with all applicable federal, state, and local regulations in the performance of this work. Where a conflict exists, follow the most stringent requirement.
- B. Applicable regulations shall include and are not limited to:
1. ANSI Z88.2 1980 Respiratory Protection and 29 CFR 1510.134, Respiratory Protection.
 2. Title 29 CFR (Code of Federal Regulations)
 3. part 1910.1025, Occupational Safety & Health Standards, Lead
 - a. part 1910.20, Access to Employee Exposure and Medical Records
 - b. part 1926.62, Lead
 - c. part 1926.21, Safety Training and Education
 4. 35IAC: Subtitle G; Parts 700-729
 5. Title 40 CFR (Code of Federal Regulations)
 - a. part 50.12, National Primary and Secondary Ambient Air Quality Standards for Lead
 - b. part 240 to 280, implementing the Resource Conservation and Recovery Act (RCRA)
 - c. part 302, implementing the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
 6. Housing and Urban Development publication:

- a. Guidelines for Abatement of Lead Based Paint in Public and Indian Housing.
- 7. 15 U.S.C. 2601 et seq., The Toxic Substances Control Act (TSCA).
- 8. Model Specifications for the protection of Workers from Lead by the Center to Protect Workers' Rights, Oct 1993.

1.04 MANIFESTS

- A. Manifests are not required, as LBP coated materials are considered construction debris and can be disposed of along with the entire building debris in an inert solid waste landfill.

1.05 DISPOSAL

- A. The following items shall be turned over to a local recycling firm:
 - 1. Structural steel beams and columns.
- B. Nonmetallic architectural components (with or without LBP) consisting of, but not limited to doors, windows, window trims, and sills, baseboards, railings, mouldings, walls, siding, and stone/brick shall be disposed of as inert demolition debris in accordance with the North Dakota Department of Health Solid Waste Management Rules, NDCC Chapter 23-29 and NDAC Article 33-20.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION



LABORATORIES, INC. Analysis, Research and Consulting

Complete Environmental Testing & Consulting Services

June 30, 2000

Trivers Associates
100 North Broadway
Suite 1800
St Louis, Missouri 63102

REFERENCE: Inspection of Suspect Asbestos-Containing Material & Lead Based Paints
Residential Dwellings, Grand Forks AFB, MFH Holly PH 1

Dear Mr. Jeff Morrisey,

A.R.C. Laboratories, Inc. is pleased to provide the enclosed Asbestos and Lead Paint Inspection Report for the residences located at 1889 I Street, 1895 I Street, 1897 I Street, 1901 I Street, 1903 I Street, & 1915 I Street at the Grand Forks Air Force Base, Grand Forks, North Dakota.

Thank you for the opportunity to be of service. Please call if you have questions, or whenever we can be of further service.

Respectfully submitted,

A.R.C. LABORATORIES, INC.

Joseph J. Worman
President



Corporate Office: 1323 9th Avenue South • Grand Forks, ND 58201 • Phone: 701-772-6496 • Fax 701-772-6416

Branch Office: 1323 23rd Street South • Fargo, ND 58103 • Phone: 701-476-2980 • Fax: 701-476-2983

Branch Office: 215 Airport Road • Bismarck, ND 58504 • Phone: 701-222-4636 • Fax: 701-222-4641

TABLE OF CONTENTS

SECTION 1.01	EXECUTIVE SUMMARY
SECTION 1.02	DATE OF INSPECTION
SECTION 1.03	LOCATION OF INSPECTION
SECTION 1.04	ARC REPRESENTATIVE
SECTION 1.05	CLIENT REPRESENTATIVE CONTACTED
SECTION 1.06	PREVIOUS INSPECTIONS AND EXCLUSION STATEMENTS
SECTION 1.07	SAMPLING RATIONAL/INVESTIGATION METHODOLOGY
SECTION 1.08	INACCESSIBLE AREAS
ATTACHMENT # 1	ASBESTOS ANALYSIS REPORT
ATTACHMENT # 2	LEAD BASED PAINT ANALYSIS REPORT
ATTACHMENT # 3	BUILDING PHOTO
ATTACHMENT # 4	INSPECTOR ACCREDITATION

**ASBESTOS & LEAD PAINT INSPECTION REPORT
FOR
RESIDENTIAL DWELLINGS, GRAND FORKKS AFB**

1.01 EXECUTIVE SUMMARY:

A.R.C. Laboratories, Inc. performed a construction specific asbestos & lead based paint inspection in accordance with the guidelines of the National Emissions Standards Hazardous Air Pollutants (NESHAPS) 40 CFR Part 61 and the Asbestos Hazards Emergency Response Act (AHERA) 40 CFR Part 763. A visual and tactile inspection of suspect asbestos-containing material (ACM) at the referenced site was performed. The Environmental Protection Agency (EPA) recognizes material that contains greater than one percent asbestos to be ACM. Representative lead paint samples were taken from each independent homogeneous area within each facility. HUD Guidelines indicate that paint containing greater than 5000 parts per million is considered to be lead based paint.

1.02 DATE OF INSPECTION:

June 27, 2000

1.03 LOCATION OF INSPECTION:

residences located at 1889 I Street, 1895 I Street, 1897 I Street, 1901 I Street, 1903 I Street, & 1915 I Street at the Grand Forks Air Force Base, Grand Forks, North Dakota.

1.04 REPRESENTATIVES:.

Mr. Joseph Worman, an accredited asbestos inspector, performed this inspection.



Signature

Mr. Joseph Worman
Inspector

Reference Attachment #2 for Asbestos Inspector Accreditation.

1.05 CLIENT REPRESENTATIVES CONTACTED:

Jeff Morrissey
Trivers Associates
100 North Broadway
Suite 1800
St Louis, Missouri 63102

1.06 PREVIOUS INSPECTIONS AND EXCLUSION STATEMENTS:

No previous asbestos inspection information was available for the construction specific work area other than inspection reports that identified materials that were abated.

A.R.C. Laboratories, Inc. warrants that the findings contained herein have been with the level of care and skill exercised by experienced and knowledgeable environmental consultants who are licensed or otherwise trained to perform asbestos inspections pursuant to the scope of work required on this project.

The asbestos inspection included inspection of accessible materials such as above or behind suspended ceilings or other non-permanent structures. A.R.C. Laboratories, Inc. did not inspect or sample inaccessible areas such as behind walls or within ductwork and did not dismantle any part of the structure to survey inaccessible areas. For the purpose of this statement, inaccessible is defined as areas of the building that could not be tested (sampled) without destruction of the structure or a portion of the structure. In the event that access to a portion of the building was not obtained (which otherwise would have been tested), such limitations are specifically identified in Section 1.08.

1.07 SAMPLING RATIONAL/INVESTIGATION METHODOLOGY:

Sample locations for the homogenous materials were selected in a random manner. The following is the list of homogeneous materials that were sampled.

The following suspect materials were sampled:

- Wall Plaster
- Ceiling Tile
- Ceiling Plaster
- Linoleum
- Mudded Pipe Fittings
- Pipe Insulation
- Sheetrock
- Sheetrock Mud
- Boiler Jacket Insulation
- Mortar
- All Different Painted Surfaces

Samples were delivered to ARC Laboratories, Inc., 1323 9th Avenue South, Grand Forks, ND 58201. Asbestos materials were analyzed by Polarized Light Microscopy (PLM) with dispersion staining. Lead samples were analyzed using Flame Atomic Absorption Spectrophotometry.

1.08 INACCESSIBLE AREAS:

Reasonable efforts were made to locate and inspect concealed areas in accordance with 40 CFR 763. Only the areas and the materials listed were inspected as part of this inspection. The asbestos inspection included inspection of accessible materials such as above or behind suspended ceilings or other non-permanent structures. A.R.C. Laboratories, Inc. did not inspect or sample inaccessible areas such as behind walls or within ductwork and did not dismantle any part of the structure to survey inaccessible areas. For the purpose of this statement, inaccessible is defined as areas of the building that could not be tested (sampled) without destruction of the structure or a portion of the structure. In the event that access to a portion of the building was not obtained (which otherwise would have been tested), such limitations are specifically identified in Section 1.08.

Attachment # 1



LABORATORIES, INC.
Analysis, Research and Consulting

Complete Environmental Testing & Consulting Services

July 5, 2000

Trivers Associates
100 North Broadway
St. Louis, Missouri 63102

Attn: Jeff Morrissey

RE: Bulk Material Sample Analysis

The bulk material samples delivered to ARC LABORATORIES, INC arrived in good condition. The samples arrived on 06/28/00 and were analyzed 06/30/00. Each sample was analyzed independently utilizing PLM dispersion staining methodology as outlined in the ("Test method - Method for determination of Asbestos in Bulk Building Materials." EPA/600/R-93/116, July 1993). The analysis was performed by a certified staff analyst and representative samples were quality controlled by our staff QAP Coordinator. The results of the analysis can be found on the enclosed report.

If you have any questions, please contact our laboratory at (701) 772-6496. Thank you for allowing ARC Laboratories, Inc. to serve your needs. We look forward to working with you in the future.

Respectfully submitted,

JOSEPH J. WORMAN

President

Analysis, Research, & Consulting Laboratories, Inc.



Corporate Office: 1323 9th Avenue South • Grand Forks, ND 58201 • Phone: 701-772-6496 • Fax 701-772-6416

Branch Office: 1323 23rd Street South • Fargo, ND 58103 • Phone: 701-476-2980 • Fax: 701-476-2983

Branch Office: 215 Airport Road • Bismarck, ND 58504 • Phone: 701-222-4636 • Fax: 701-222-4641

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/30/00
ARC Project #: GF5918B.TA

Client Project #: 1889 I Street
Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43014-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43015T-2 2T	Floor Tile - Kitchen Tan Cementitious	Cell. 1-3% Silicates	ND
43015M-3 2M	Floor Tile Mastic Black Tar	Cell. 5-10% Silicates	Chrys. 2% - 5%
43016-4 3	Linoleum - Bath - Main Floor Gray Pliable	Cell. 10-20% Silicates	ND
43017-5 4	Linoleum - Bath - Upstairs Gray Pliable	Cell. 20-30% Silicates	ND
43018-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 5-10% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GIWl = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Synt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST: 

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/30/00
ARC Project #: GF5920B.TA

Client Project #: 1895 I Street
Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43019-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43020T-2 2T	Floor Tile - Kitchen Gray Cementitious	Cell. 1-3% Silicates	ND
43020M-3 2M	Floor Tile Mastic Black Tar	Cell. 2-5% Silicates	Chrys. 5% - 10%
43021-4 3	Linoleum - Bath - Main Floor Gray Pliable	Cell. 20-30% Silicates	ND
43022-5 4	Linoleum - Bath - Upstairs Gray Pliable	Cell. 20-30% Silicates	ND
43023-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 5-10% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GIWl = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Synt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST: 

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/30/00
ARC Project #: GF5922.TA

Client Project #: 1897 I Street
Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43024-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43025T-2 2T	Floor Tile - Kitchen Gray Cementitious	Cell. 1-3% Silicates	ND
43025M-3 2M	Floor Tile Mastic Black Tar	Cell. 2-5% Silicates	Chrys. 5% - 10%
43026-4 3	Linoleum - Bath - Main Floor Gray Pliable	Cell. 20-30% Silicates	ND
43027-5 4	Linoleum - Bath - Upstairs Gray Pliable	Cell. 20-30% Silicates	ND
43028-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 10-20% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GIWI = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Synt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

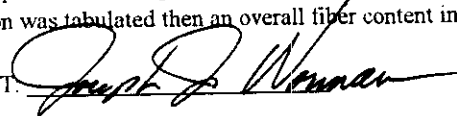
Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST: 

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00

Date Analyzed: 06/30/00

ARC Project #: GF5924.TA

Client Project #: 1901 I Street

Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43029-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43030T-2 2T	Floor Tile - Kitchen Gray Cementitious	Cell. 1-3% Silicates	ND
43030M-3 2M	Floor Tile Mastic Black Tar	Cell. 2-5% Silicates	Chrys. 5% - 10%
43031-4 3	Linoleum - Bath - Main Floor Gray Pliable	Cell. 20-30% Silicates	ND
43032-5 4	Linoleum - Bath - Upstairs Gray Pliable	Cell. 20-30% Silicates	ND
43033-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 10-20% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GIWl = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Synt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST:

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00

Date Analyzed: 06/30/00

ARC Project #: GF5926.TA

Client Project #: 1903 I Street

Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43034-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43035T-2 2T	Floor Tile - Kitchen Gray Cementitious	Cell. 1-3% Silicates	ND
43035M-3 2M	Floor Tile Mastic Black Tar	Cell. 2-5% Silicates	Chrys. 5% - 10%
43036-4 3	Linoleum - Bath - Main Floor Gray Pliable	Cell. 20-30% Silicates	ND
43037-5 4	Window Caulk - Front Porch/Entry White Pliable	Cell. 2-5% Silicates	ND
43038-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 5-10% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GlWl = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Svnt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST: 

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

BULK MATERIAL ANALYSIS REPORT

Laboratory: ARC Laboratories, Inc.
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 North Broadway
St. Louis, MO 63102

Date Received: 06/28/00

Date Analyzed: 06/30/00

ARC Project #: GF5928B.TA

Client Project #: 1915 I Street

Project Description: Bulk Material Analysis

SAMPLE #	SAMPLE IDENTIFICATION, COLOR AND DESCRIPTION	OTHER MATERIAL TYPE AND/OR %	TYPE AND PERCENT ASBESTOS
43039-1 1	Joint Compound White Cementitious	Cell. 1-3% Silicates	ND
43040T-2 2T	Floor Tile - Kitchen Gray Cementitious	Cell. 1-3% Silicates	ND
43040M-3 2M	Floor Tile Mastic Black Tar	Cell. 10-20% Silicates	Chrys. 5% - 10%
43041-4 3	Linoleum - Bath Gray Pliable	Cell. 20-30% Silicates	ND
43042-5 4	Linoleum - 1/2 Bath Gray Pliable	Cell. 20-30% Silicates	ND
43043-6 5	Sheetrock - Basement Stairwell White Cementitious	Cell. 1-3% Silicates	ND

KEY: ND = None Detected

Cell = Cellulose

MnWl = Mineral Wool

GIWl = Glass Wool

CaCO₃ = Calcium Carbonate

CaSO₄ = Calcium Sulfite

Synt = Synthetics

Chrys = Chrysotile

Amos = Amosite

Trem = Tremolite

Croc = Crocidolite

Actn = Actinolite

Anth = Anthophyllite

ANALYSIS METHOD: PLM Dispersion Staining. If the sample was inhomogeneous it was split into separate homogeneous sections and each part was analyzed independently. Fiber content for each section was tabulated then an overall fiber content involving all parts was calculated.

NVLAP Laboratory Code Number: 1832

ANALYST: 

Microscopy Specialist

This document cannot be duplicated, except in its entirety, without express written authorization from ARC Laboratories, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested.

Attachment # 2



LABORATORIES, INC.

Analysis, Research and Consulting

Complete Environmental Testing & Consulting Services

June 30, 2000

Trivers Associates
100 North Broadway
Suite 1800
St. Louis, Missouri 63102

Attn: Jeff Morrissey

RE: Lead in Paint Analysis

The samples for lead analysis arrived in good condition. The samples were analyzed according to current U.S. Environmental Protection Agency Protocols using the NIOSH 7082M method. The results of the analysis can be found on the enclosed report.

If you have any questions, please feel free to contact our office at (701) 772-6496. Thank you for allowing our firm to serve your needs.

Respectfully submitted,

Joseph J. Worman
President
Analysis, Research & Consulting Laboratories, Inc.



Corporate Office: 1323 9th Avenue South • Grand Forks, ND 58201 • Phone: 701-772-6496 • Fax 701-772-6416

Branch Office: 1323 23rd Street South • Fargo, ND 58103 • Phone: 701-476-2980 • Fax: 701-476-2983

Branch Office: 215 Airport Road • Bismarck, ND 58504 • Phone: 701-222-4636 • Fax: 701-222-4641

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5925L.TA

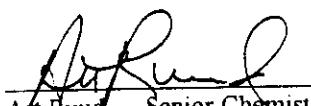
Client Project #: 1901 I Street
Project Description: Lead Samples

SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04885 1	Paint Chips Garage Door	200.0	4517
04886 2	Paint Chips Interior Trim	200.0	BDL
04887 3	Paint Chips Wall - Upstairs	200.0	BDL
04888 4	Paint Chips Post and Beam - Basement	200.0	4332
04889 5	Paint Chips Wall - Basement	200.0	BDL

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst: 

Art Ruud, Senior Chemist

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5923L.TA

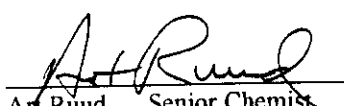
Client Project #: 1897 I Street
Project Description: Lead Samples

SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04880 1	Paint Chips Garage Door	200.0	BDL
04881 2	Paint Chips Interior Trim	200.0	BDL
04882 3	Paint Chips Wall - Upstairs	200.0	BDL
04883 4	Paint Chips Post and Beam - Basement	200.0	5753
04884 5	Paint Chips Wall - Basement	200.0	BDL

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst: 

Art Ruud, Senior Chemist

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5921L.TA

Client Project #: 1895 I Street
Project Description: Lead Samples


SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04875 1	Paint Chips Garage Door	200.0	20826
04876 2	Paint Chips Upstairs Trim	200.0	1291
04877 3	Paint Chips Wall - Upstairs	200.0	253
04878 4	Paint Chips Post and Beam - Basement	200.0	7856
04879 5	Paint Chips Wall - Basement	200.0	BDL

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst:


Art Ruud, Senior Chemist

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5919L.TA

Client Project #: 1889 I Street
Project Description: Lead Samples


SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04870 1	Paint Chips Garage Door	200.0	14426
04871 2	Paint Chips Interior Trim	200.0	BDL
04872 3	Paint Chips Wall - Upstairs	200.0	BDL
04873 4	Paint Chips Post and Beam - Basement	200.0	3832
04874 5	Paint Chips Wall - Basement	200.0	BDL

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst:


Art Ruud, Senior Chemist

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5927L.TA

Client Project #: 1903 I Street
Project Description: Lead Samples

SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04890 1	Paint Chips Garage Door	200.0	903
04891 2	Paint Chips Interior Trim	200.0	206
04892 3	Paint Chips Wall	200.0	BDL
04893 4	Paint Chips Post and Beam - Basement	200.0	3236
04894 5	Paint Chips Wall - Basement	200.0	BDL

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst:


Art Ruud. Senior Chemist

LEAD IN PAINT ANALYSIS

Laboratory: ARC Laboratories, Inc
1323 9th Avenue S.
Grand Forks, ND 58201

Client: Trivers Associates
Address: 100 N. Broadway
St. Louis, MO 63102

Date Received: 06/28/00
Date Analyzed: 06/29/00
ARC Project #: GF5929L.TA

Client Project #: 1915 I Street
Project Description: Lead Samples

SAMPLE #	DESCRIPTION/LOCATION	DETECTION LIMIT (PPM)	LEAD CONTENT (PPM)
04895 1	Paint Chips Garage Door	200.0	56375
04896 2	Paint Chips Interior Trim	200.0	296
04897 3	Paint Chips Wall	200.0	206
04898 4	Paint Chips Post and Beam - Basement	200.0	1573
04899 5	Paint Chips Wall - Basement	200.0	273

PPM= Parts Per Million

BDL= Below Detection Limit

Note: Paint containing greater than 0.5 % by weight or 5000 parts per million is considered to be lead based paint.

Analyst:


Art Ruud.

Senior Chemist

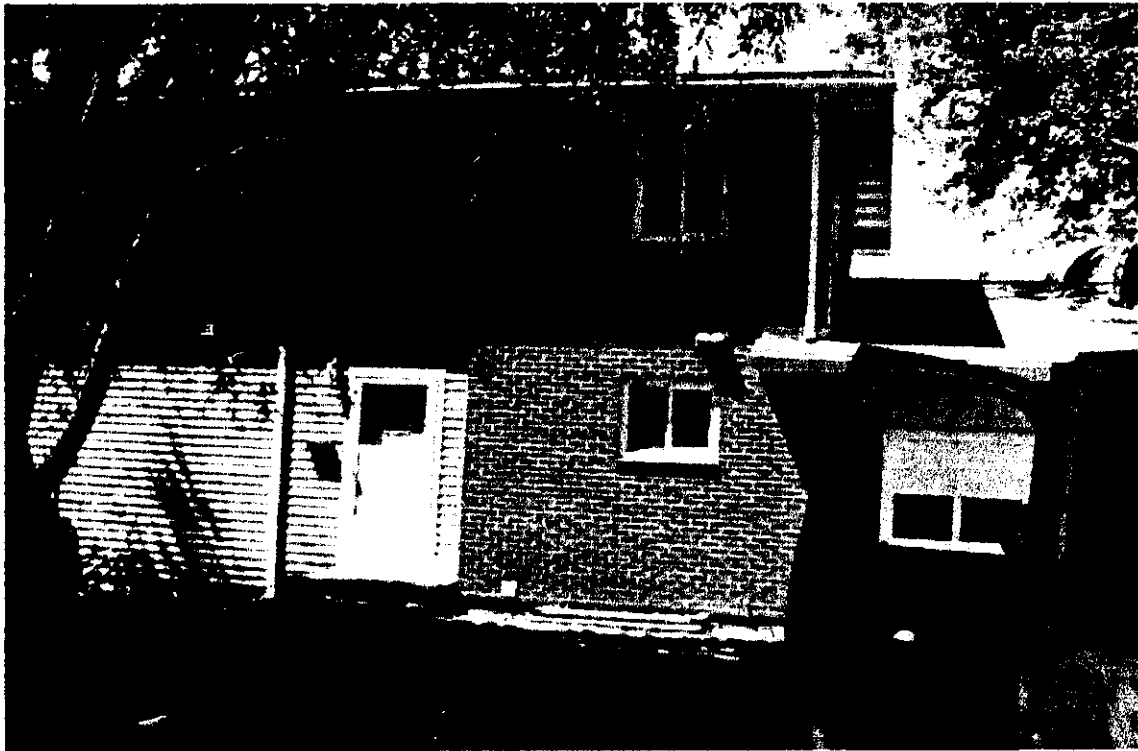
Attachment # 3



1889 I Street



1895 I Street



1897 I Street



1901 I Street



1903 I Street



1915 I Street

Attachment # 4



North Dakota Department of Health

Certificate

SS# 504-76-3394

of

No. 341

Asbestos Abatement

This is to certify that Joseph J. Worman has met the requirements of Chapter 33-15-13 of the North Dakota Air Pollution Control Rules for certification in the following asbestos abatement discipline(s):

☒ Supervisor Exp: 2/10/01

Worker

☒ Inspector Exp: 1/12/01

Management Planner

Project Designer

☒ Project Monitor Exp: 2/10/01

Kenneth H. Hargler

Manager

Asbestos Control Program



North Dakota Department of Health

Certificate

SS# 501-68-3137

of

No. 2839

Asbestos Abatement

This is to certify that Arthur L. Ruud has met the requirements of Chapter 33-15-13 of the North Dakota Air Pollution Control Rules for certification in the following asbestos abatement discipline(s):

☒ Supervisor Exp: 8/23/00

Worker

☒ Inspector Exp: 1/12/01

Management Planner

☒ Project Designer Exp: 3/24/00

☒ Project Monitor Exp: 8/23/00

Kenneth H. Hargler

Manager

Asbestos Control Program

SECTION 02070
SELECTIVE DEMOLITION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. All labor, materials, and equipment required to complete all demolition work
- B. Removal of parts of building as indicated on the drawings
- C. Sawcut new openings in existing basement concrete foundation walls for new vinyl egress windows.
- D. Provide protective materials and devices
- E. Remove debris from site

1.02 RELATED DOCUMENTS/SECTIONS

- A. Section 01010 – General Requirements
- B. Section 04200 – Masonry fill and patchwork for openings

1.03 GENERAL INSTRUCTIONS

- A. Before starting demolition work, notify the Architect and discuss methods of procedure, and then execute work in accordance with the acceptable methods.

1.04 PROTECTION

- A. Provide dust-tight frames for closing openings as required to restrict dust to localized areas.
- A. Protect existing utilities that are to remain.
- B. Plaster, windows, doors, devices, etc., which are not to be removed, reworked, or reconditioned under the Contract, shall be completely protected from damage.
- C. Debris shall be kept damp until removed from the site.
- D. Materials that are to be reused in new construction shall be stored in protected area until reinstalled.

PART 2 – PRODUCTS

2.01 PROTECTIVE MATERIALS

- A. Planking, bracing, shoring, needles, and other devices of sufficient strength to support all loads imposed shall be provided under this section.
- B. Provide all necessary wood framing, 2 x 4 minimum, and sound plywood to provide temporary partitions between existing areas and areas to be demolished. Review location with Architect prior to erection. All exposed faces of plywood shall be painted with fire-resistive intumescent paint. Reinforced plastic over treated wood frames is also approved. Review with the Architect.

PART 3 – EXECUTION

3.01 GENERAL

- A. Demolition work shall be executed in an orderly and careful manner. Under no circumstances will any waste, either inert, construction or municipal, be buried in any excavation associated with this project. All waste and debris will be removed from government property and disposed of in accordance with all federal and state regulations and guidelines.
- B. Care shall be taken in cutting into existing areas that are to remain to prevent damaging adjoining materials. Leave all finish materials with clean cuts to receive new work. All interior cutting of concrete and masonry shall be done wholly or partially with a concrete saw, where possible, to provide clean breaks for new openings.
- C. Garage concrete slabs requiring removal and replacement.

<u>Address</u>	<u>Work Condition</u>
▪ 1887B "I" Street	Remove and Replace
▪ 1899B "I" Street	Occupied
▪ 1905B "I" Street	Remove and Replace
▪ 1909A "I" Street	Not Determined
• 1885A "I" Street	Occupied

3.02 DISPOSAL/

- A. All material removed, including wood, wood chips, broken concrete, rubbish and any other material not being reused or listed in 3.02, B, shall become the property of the Contractor and shall be removed from the site; accumulation of rubbish will not be permitted.
- B. The following items shall remain the property of the Owner and will be removed by Housing Management from all 30 family units prior to contractor prebid walk through or notice to proceed.
 - 1. Kitchen Cabinets.
 - 2. Refrigerators and Gas Ranges. Gas ranges and refrigerators will be stored in Housing Management designated Grand Forks AFB warehouse. Reference Section 11450 - Residential Equipment.

END OF SECTION 02070

This page was intentionally left blank for duplex printing.

SECTION 02100
SITE PREPARATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Demolition of paving and site features.
- B. Protection of existing work to remain.
- C. Hauling and disposition of materials and debris.

1.02 RELATED SECTIONS

- A. Section 02070 – Selective Demolition.
- B. Section 02200 – Earthwork: Backfilling, compaction requirements, and topsoil stripping.
- C. Division 15 – Mechanical.
- D. Division 16 – Electrical.

1.03 QUALITY ASSURANCE

- A. Verify that all utility supply lines have been shut off before removal of applicable site features.
- B. Comply with all applicable safety codes for demolition work.
- C. Pay all required fees and obtain all necessary permits and licenses required for demolition work.
- D. Verify that suitable pedestrian and vehicular barricades have been erected prior to beginning work. Refer to Section 02070 – Selective Demolition.

1.04 ENVIRONMENTAL CONDITIONS

- A. Refer to the drawings for extent of site preparation work required.

- B. Existing Site Features and Utilities:
1. Protect trees, shrubs, lawns, and other features remaining as a portion of final landscaping and part of existing adjacent properties off site. Do not strip topsoil, pile construction equipment, or in any other way disturb area under the drip-line of trees to remain.
 2. Protect bench marks, existing structures, sidewalks, paving and curbs and other features from damage during construction.
 3. Protect above and below grade utilities which are to remain.
 4. See Section 02950 for pruning of trees and shrubs to remain which have been disturbed by work of this section.
- C. All such items damaged during construction shall be repaired or replaced as required to match existing conditions as directed by the Contracting Officer.
- D. All work related to relocation, removal or adjustment of existing utility lines shall be carefully coordinated with the Contracting Officer. See Section 02200 – Earthwork for requirements for locating and marking existing utilities.
- E. Cutting, capping and removal of utility supply lines shall be in conformance with the requirements of the respective utility owners and as specified in Divisions 15 and 16.
- F. Layout of work shall be as shown on the drawings and shall be performed by a registered surveyor or engineer.
- G. In the event the Contractor encounters on the site material reasonably believed to be hazardous, such as but not limited to: buried fuel tanks, raw sewage, paints or solvents, the Contractor shall immediately stop Work in the area affected and report the condition to the Contracting Officer in Writing. See Section 01010 – General Requirements for safety precautions, programs, and required procedures.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

3.01 GENERAL

- A. Verify demolition of slabs, and pavements as specified in Section 02070 – Selective Demolition and on drawings.

3.02 SITE DEMOLITION

- A. Remove existing concrete site paving and slabs including aggregate base where shown. Saw cut edges of existing paving to remain. Remove concrete paving to the nearest joint beyond the removal area.
- B. Remove above and below ground portions of all other site features interfering with construction.
- C. Fill voids created by site demolition and removal with approved compacted fill as specified in Section 02200 – Earthwork.
- D. Remove existing utilities and utility poles as indicated on plans. Construct brick or concrete bulkheads or provide and install manufactured plug of like material in the undisturbed section of the utility as shown on the plans. Back fill all voids as per Section 02200 – Earthwork.
- E. Abandon existing utilities in place as shown. Construct brick or concrete bulkheads, in the undisturbed section of the abandoned sewer as shown on plans. Cap existing utilities as noted on utility drawings and in Divisions 15 and 16.
- F. Tree Removal: Tag all trees noted on drawings to be removed. Verify with Base Civil Engineering Department and Contracting Officer. Grand Forks AFB reserves the right to relocate all trees marked for removal.

3.03 CLEARING AND GRUBBING

- A. Remove all trees and shrubs shown on the drawings to be removed. Removal shall include stumps in their entirety and roots over 3 inches in diameter. Remove additional roots and organic matter in areas to receive earth fill or structural loads as directed by the Soil Engineer and backfill and compact voids as per Section 02200 – Earthwork. Care shall be taken to avoid damage to existing trees to remain.
- B. Existing trees to remain shall be tagged by the contractor and verified by the Contracting Officer.
- C. Grub all areas within the limits of seeding to a depth of 3 inches, (except under the drip lines of trees indicated to remain), or as required to remove all sod, roots, and other organic material completely.
- D. Refer to Section 02200 – Earthwork for topsoil stripping and stockpiling.

3.04 HAULING AND DISPOSAL OF DEBRIS

- A. All debris resulting from the demolition of structures and site features and clearing and grubbing operations shall be hauled away and disposed of legally off of the Government's property or as specified in Section 02070 Selective Demolition.
- B. Debris shall be hauled away at frequent intervals in order to prevent material from accumulating on the site. If Contractor fails to remove excess debris promptly, the Government reserves the right to cause same to be removed at Contractor's expense.
- C. Burning of materials on the site will not be permitted.

- D. Leave the Government's property clean, neat and in an orderly condition.
- E. Ownership of Removed Materials:
 - 1. Rubbish and debris created by demolition work, and all removed fixtures and equipment shall become property of the Contractor unless otherwise noted.
 - 2. Sale of salvaged items on the site will not be permitted.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Removal and stockpiling of topsoil, excavation, embankment, and rough grading.
- B. Compaction requirements.

1.02 RELATED SECTIONS

- A. Section 01300 - Submittals
- B. Section 01400 – Quality Control
- C. Section 02070 – Selective Demolition.
- D. Section 02500 – Paving and Surfacing.
- E. Section 02936 – Sodding
- F. Section 02950 – Trees and Shrubs
- G. Section 03300 – Cast-In-Place Concrete.
- H. Division 15 – Mechanical.
- I. Division 16 – Electrical.

1.03 QUALITY ASSURANCE

- A. Requirements for Compaction and soil bearing strength shall be as specified in this section.
- B. Work shall be performed in the presence of the Soil Engineer and/or Contracting Officer as specified in Section 01400 – Quality Control, Earthwork Field Observation and Testing.
- C. Tolerances for finished surfaces shall be as specified in this section.
- D. Provide careful layout and control for all work by Registered Surveyor or Engineer.

1.04 ENVIRONMENTAL REQUIREMENTS

A. Existing Conditions:

1. Field verify existing soil conditions and topographic features prior to construction. Provide subgrade soil testing as required. Immediately report all discrepancies between existing surface and subsurface conditions and work as shown on the drawings and specified to the Contracting Officer.

B. Existing Site Features and Utilities:

1. Protect trees, shrubs, lawns, and other features remaining as a portion of final landscaping and part of existing adjacent properties off site. Do not strip topsoil, pile construction equipment, or in any other way disturb area under the drip-line of trees to remain.
2. Protect bench marks, existing structures, sidewalks, paving and curbs and other features from damage during construction.
3. Protect above and below grade utilities which are to remain.
4. See Section 02950 for pruning of trees and shrubs to remain which have been disturbed by work of this section.

C. Dust Control:

1. Provide all temporary measures required for control of dust when required by code requirements or directed by the Contracting Officer. Control dust by application of water. Use of calcium chloride or other chemical is not permitted.

D. Blasting:

1. The use of explosives for any purpose during the construction of this project is prohibited.

PART 2 – PRODUCTS

2.01 SATISFACTORY FILL MATERIALS

- A.** Satisfactory fill materials shall consist of clean, non-organic site or imported soil that consists of compactable soil that will achieve an in-place dry weight density in excess of 105 pounds per cubic foot and contain no topsoil, stones larger than 6 inches, organic matter or debris. Materials shall be as classified in ASTM D 2487-85 as GW, GP, SW, SP, SM, GM, GC, SC, and CL properly worked by Contractor to obtain optimum moisture and compaction. Contractor shall provide earth fill from off-site sources as required to complete grading operation. All bearing material shall be approved by the Soil Engineer and/or Contracting Officer. Soil acceptance shall be determined prior to incorporation into the work based on samples taken from stock piles.
- B.** In addition, broken inorganic rubble including concrete, asphalt and paving base materials with a dimension of no larger than 3 inches in any direction may be used for fill in paved areas and under building slabs and footings to a point 2 feet below finished subgrade and to a point 4 feet below finished grade in lawn and planting areas. Such material shall not be used for backfilling

building walls. All material shall be approved by the Soil Engineer and/or Contracting Officer and placed as directed.

2.02 UNSATISFACTORY MATERIAL

- A. Unsatisfactory materials for fill construction and for subgrade under structures, piping, or paving include materials classified in ASTM D 2487 as PT, NL, CH, OH, MH, and OL, and topsoil or other organic contaminated material, debris and rocks over 6 inches. Do not use shale bedrock encountered on-site as fill material. Materials of any classification that are determined by the Soil Engineer and/or Contracting Officer as too wet or too soft for providing stable fill, stable subgrade or stable foundation for structures and paving will be classified as "unsatisfactory."

2.03 SELECT BACKFILL MATERIALS

- A. Type A: type A material shall consist of sand, stone, gravel, or stone screenings, uniformly graded, and free from an excess of soft or unsound particles or other objectionable material. When tested by laboratory sieve in accordance with ASTM Test Method C136, the material shall conform to the following gradation limits:
- | | |
|-------------------------|----------------|
| Passing 2 inch sieve: | 100 percent |
| Passing 1 inch sieve: | 70-100 percent |
| Passing 3/4 inch sieve: | 50-85 percent |
| Passing No. 4 sieve: | 25-60 percent |
| Passing No. 40 sieve: | 10-30 percent |
| Passing No. 200 sieve: | 0-20 percent |
- B. Furnish certified laboratory test reports prior to use of the material.
- C. Type B: Type B material for fill under building slabs on grade where shown on the drawings shall consist of crushed stone or crushed gravel screenings, uniformly graded and free from a excess of soft or unsound particles or other objectionable material. When tested by laboratory sieve in accordance with ASTM Test Method C136, the material shall conform to the following limits:
- | | |
|---------------------------|----------------|
| Passing 1-1/2 inch sieve: | 100 percent |
| Passing 1 inch sieve: | 95-100 percent |
| Passing 1/2 inch sieve: | 60 percent |
| Passing No. 4 sieve: | 0-10 percent |
| Passing No. 8 sieve: | 0-5 percent |
- D. Foundation wall backfill shall consist of Inorganic pit run sand fill, uniformly graded and free from excess soft or unsound particles or other objectionable material. When tested by laboratory sieve in accordance with ASTM Test Method C136, the material shall conform to the following limits:
- | | |
|----------------------|------------|
| Passing No. 4 sieve: | 85 percent |
| Passing No. 8 sieve: | 10 percent |
- E. Furnish certified laboratory test reports prior to use of the material.

PART 3 – EXECUTION

3.01 PREPARATION

- A. See Section 02070 – Demolition and Removal, for requirements for demolition and disposition of materials.
- B. Identify required lines, levels, contours, and datum. Set and maintain benchmarks as required for accurate control of the work.
- C. Verify quantities for earthwork excavation, embankment, rough grading, topsoil, etc. Contractor shall import satisfactory soils from off-site sources or dispose of excess soil as specified in this Section in quantities required to perform the work as shown and specified at no additional cost.
- D. Prior to excavation, verify and clearly mark locations and depths of existing underground utility lines and new utility lines installed as a part of this project. Contact the Contracting Officer at least 72 hours prior to commencement of excavation work for verification of utility line locations. Field verify locations of utilities shown on the drawings.
- E. Verify that preceding work affecting work of this section has been satisfactorily completed. Correct conditions adversely affecting the work of this Section.

3.02 REMOVAL OF UNSUITABLE MATERIALS

- A. Remove topsoil from the entire area within the limits of grading and areas to receive paving, structures or other site improvements and as shown and as directed by the Soil Engineer and/or Contracting Officer. Do not strip topsoil under drip-line of trees to remain. Stockpile for re-use in location approved by Contracting Officer. Where existing trees are designated to remain, leave existing topsoil in place within the drip line.
- B. Subgrade for paving to be used by vehicular traffic shall be undercut 18" (inches) minimum and filled to subgrade with suitable compacted material.
- C. Remove all other unsuitable site soil as directed by the Soil Engineer and/or Contracting Officer.

3.03 EXCAVATION – GENERAL

- A. All excavating required for the installation of piped utilities, foundations, subgrades and bases shall be performed to the required depths as shown on the drawings and/or specified. Excavation shall include all materials encountered: clay, silt, sand, mulch, gravel, hardpan, loose shale, loose stone in masses, and rock. Excavations shall be of the width necessary for the proper execution of the work, and excavation banks shall be as nearly vertical as is possible. Unless indicated otherwise, all excavating shall be accomplished by open cut. All excavation work shall be left in a uniform and neat condition (as determined by the Contracting Officer) when backfilling is completed.

- B. All excavations required, including excavation for building, storm drainage, and utility services are on an unclassified basis, no separate consideration is given to the type of material encountered.
- C. Stockpile subgrade soil separately from topsoil.
- D. Excavate only to depths shown. Excess excavation not ordered is to be replaced as directed by the Contracting Officer and specified by this Section and at the Contractor's expense.
- E. Protect all existing paving to remain. Paving which is cut in the excavating or trenching process shall be repaired with the same thickness and type of base and paving materials to match the pavement prior to excavation unless otherwise shown. Subgrade areas below repaired paving shall be compacted as specified in this Section to prevent settlement. Where settlement occurs the work shall be removed and replaced in a proper condition.
- F. All excavated materials suitable for use as backfill shall be stored in an orderly manner at a distance sufficient from the banks of any excavation to avoid overloading and to prevent slides and cave-ins.
- G. If rock is encountered, excavations shall be made to permit installation of footings, bases, and utilities as detailed in the plans or otherwise specified. If rock is encountered during installation of utility lines, excavation shall be made to 4 inches (minimum) below the lowermost pipe and then be backfilled with loose, moist sand or fine gravel firmly compacted to the bottom of the pipe. Adjustment to the plans caused by encounter with rock shall be as approved by the Contracting Officer.
- H. Do not excavate by blasting.

3.04 EMBANKMENT – GENERAL

- A. All areas to receive fill shall be proof-rolled as directed in the presence of the Soil Engineer and/or Contracting Officer prior to filling. Unstable subgrade soils shall be removed as directed and replaced with suitable material.
- B. Place fill in loose layers not to exceed 8 inches in loose depth. Compact each layer of fill to the percentages of density as specified in this Section.
- C. Where fill is to be placed on an existing surface with a slope of 5:1 (5 feet horizontal to 1 foot vertical) or greater, horizontal benches with a minimum width of 12 feet shall be cut into the existing slope to permit compaction of new fill in horizontal layers. Slopes between horizontal benches shall be as nearly vertical as the soils will permit.
- D. Fill material which does not contain sufficient moisture to compact in accordance with the above requirements, shall be sprinkled with water in accordance with the directions of the Soil Engineer and/or Contracting Officer. Fill material containing excess moisture shall be permitted to dry to the proper consistency before being compacted.
- E. Frozen material shall not be placed in the fill nor shall fill be placed upon frozen material. Fill shall be free of organic material.

3.05 ROUGH GRADING

- A. Perform all cutting, filling, compaction of fills and rough grading required to bring the entire project area to subgrade as follows:
 - 1. For areas within the buildings, to the bottom of slab base as shown on the drawings.
 - 2. For all surfaced areas (drives, parking lots, walkways, etc.) to the underside of the subbase or base course as fixed by finished grades.
 - 3. For lawn areas, to 6 inches below finished grades as shown on the drawings.
 - 4. For all planting beds, to 18 inches below finished grades as shown on the drawings.
- B. All finished surfaces shall drain to locations as shown.
- C. For option areas not taken, where buildings, basements, utilities, and housing unit paving has been removed:
 - 1. Fill voids and rough grade as noted in this Section.
 - 2. Grade as lawn area as noted above.
 - 3. Fine grade with topsoil placement as per Section 02936 – Seeding and Sodding.
 - 4. Grade area smooth and insure proper drainage.
 - 5. Seed area as per Section 02936 Seeding and Sodding.

3.06 COMPACTION REQUIREMENTS AND TESTING

- A. Excavation of unsuitable material, proof-rolling, preparation of subgrade bearing surfaces, placement of controlled fill and compaction of subgrade surfaces shall be under the full-time supervision of the Soil Engineer and/or Contracting Officer as per Section 01400.
- B. Quality Control. The contractor is not authorized to bring radioactive materials on Grand Forks AFB without prior approval of the base Radiation Safety Officer per AFI-201. Base RSO can be reached at 7-5596.
- C. Compact soil materials to the maximum dry density as per ASTM D 698-91 as follows:
 - 1. Subgrade compaction – 100 percent.
 - 2. Backfill for structures:
 - a. Earth backfill – 98 percent
 - b. Granular backfill – 96 percent.
 - 3. Backfill for trenches – 100 percent.
 - 4. Controlled fill – 100 percent.
- D. The required subgrade bearing strength for column and wall footings is 3,000 pounds per square foot. See section 03300 – Concrete.
- E. Compact subgrade for paving to a depth of 12 inches.

3.07 SLABS ON GRADE

- A. Over excavate under building and garage slabs as necessary to remove undesirable materials containing organics and fill as directed by Soils Engineer. Raise the grade of this over-excavation to desired subgrade by using in organic, pit run sand.

- B. Provide compacted granular material directly under concrete floor slabs on grade as shown on the drawings. Granular material shall be Type B select backfill material. Compact to 100 percent maximum dry weight density as per ASTM D 698.

3.08 TOPSOIL

- A. See Section 02936 – Seeding for topsoil quality requirements, placement of topsoil and fine grading. Provide additional topsoil, if required, from off-site sources at no additional cost.

3.09 DISPOSAL OF EXCESS AND WASTE MATERIAL

- A. Unsuitable subgrade material, trash, debris, and excess material shall be removed from the property and disposed of legally off-site.

3.10 LINES AND LEVELS

- A. All lines and levels for earthwork shall be based on the Contractor's benchmark or reference point and survey work shall be done under the direction of a Registered Engineer or Surveyor.
- B. Finish grades shall be field verified by a Registered Engineer or Registered Surveyor.
 - 1. Tolerances for finished surfaces in lawn areas shall be 0.10 feet.
 - 2. Tolerances for finished surfaces in paved areas shall be 0.01 feet.

END OF SECTION 02200

This page was intentionally left blank for duplex printing.

SECTION 02500
PAVING AND SURFACING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Pavement base(s).
- B. Portland cement concrete paving.
- C. Joint sealer.

1.02 RELATED SECTIONS

- A. Division 1 – General Requirements.
- B. Section 02200 – Earthwork.
- C. Section 02800 – Site Improvements.
- D. Section 02936 – Sodding
- E. Section 02950 – Trees, Plants, and Groundcover.
- F. Section 03300 – Cast-In-Place Concrete.
- G. Section 07900 – Joint Sealants.

1.03 REFERENCES

- A. American Society for Testing Materials (ASTM).
 - 1. ASTM D 1751 – Preformed, Non-extruding Type Bituminous Joint Filler.
- B. The Asphalt Institute (AI).
- C. American Concrete Institute (ACI).
- D. The state of North Dakota, Department of Transportation, Construction and Material Specifications (NDDOT), latest edition.

1.04 SUBMITTALS

- A. Testing laboratory reports for portland cement concrete as per Section 03300.
- B. Manufacturer's literature for joint sealant for approval by Contracting Officer. Include manufacturer's instructions for use.
- C. Samples as specified.
- D. Testing laboratory reports of results of all compaction tests.

1.05 QUALITY ASSURANCE

- A. Requirements for subgrade compaction and soil testing are as specified in Section 02200.
- B. Provide laboratory testing for portland cement concrete as per Section 03300 – Cast-In-Place Concrete.
- C. Tolerances for finished surfaces shall be as specified in Section 02200.
- D. All finished surfaces shall be smooth and free flowing. Create smooth vertical curves through high and low points indicated by spot elevations and contours. Provide uniform slopes between new and existing grades. Avoid ridges and depressions. All surfaces must drain.
- E. All thickness shown on the drawings shall be compacted thickness.
- F. All lines and levels for paving work shall be based on the General Contractor's benchmark or reference point and layout work shall be performed by a registered Civil Engineer or registered Surveyor as per Section 01400 – Quality Control.
- G. Obtain materials from same source throughout.
- H. All finished surfaces shall be of the same color and texture and when installed, resulting in a uniform pavement surface. Non-conforming portions of finished paving shall be removed and replaced.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Existing Site Features:
 - 1. Protect trees, shrubs, lawns, and other features remaining as a portion of final landscaping. Do not strip topsoil, pile construction equipment, or in any other way disturb area under the drip-line of trees to remain.
 - 2. Protect bench marks, existing structures, sidewalks, paving, and curbs from equipment and vehicular traffic.
 - 3. Protect above and below grade utilities which are to remain.
- B. Weather limitations for the placement and curing of concrete pavement shall comply with Section 03300 – Cast-In-Place Concrete.

PART 2 – PRODUCTS

2.01 PORTLAND CEMENT CONCRETE PAVING

- A. Subbase: As per NDDOT Standards.
- B. Aggregate Base Course: No. 57 stone, per NDDOT Standards.
- C. Portland Cement Concrete:
 - 1. Concrete for walks, slabs, equipment pads and other finished surfaces shall be minimum 4,000 psi air entrained as per Section 03300.
 - 2. Concrete curbs shall be minimum 4,000 psi air entrained as per Section 03300.
 - 3. Calcium chloride shall not be used as an accelerator.
 - 4. Steel reinforcing shall be as specified in Section 03300.
- D. Portland Cement Concrete: As per NDDOT Standards.
- E. Garage concrete slabs to be removed and replaced.

2.02 EXISTING GARAGE SLAB REPLACEMENT

Provide demolition of existing garage concrete slab, removal and haul off of concrete, placement of new compacted granular fill and new 6 inch thick, cast in place concrete slab in each garage indicated (“**Remove and Replace**”) below and according to this Section. See Bidding Schedule (Section 00010-3) for Buildings classified as Basic Bid and Option Bid.

- 1. One garage (approximately 300 square feet in area) and a total of 30 garages in 15 family buildings.

<u>Address</u>	<u>Work Condition</u>
1887A “I” Street	Mudjack
1887B “I” Street	Remove and Replace
1891A “I” Street	No Work Required
1891B “I” Street	No Work Required
1893A “I” Street	Mudjack
1893B “I” Street	No Work Required
1899A “I” Street	Mudjack
1899B “I” Street	Occupied
1905A “I” Street	Mudjack
1905B “I” Street	Remove and Replace
1909A “I” Street	Mudjack
1909B “I” Street	Mudjack
1911A “I” Street	No Work Required
1911B “I” Street	Mudjack
1883A “I” Street	Mudjack
1883B “I” Street	Mudjack
1885A “I” Street	Occupied
1885B “I” Street	No Work Required

1889A "I" Street	Mudjack
1889B "I" Street	No Work Required
1895A "I" Street	No Work Required
1895B "I" Street	No Work Required
1897A "I" Street	Mudjack
1897B "I" Street	Mudjack
1901A "I" Street	Mudjack
1901B "I" Street	No Work Required
1907A "I" Street	No Work Required
1907B "I" Street	Mudjack
1913A "I" Street	Mudjack
1913B "I" Street	Mudjack

2.03 ACCESSORIES

- A. Joint Filler: Preformed, nonextruding, bituminous type, ASTM D 1751.
- B. Joint Sealant: See Section 07900 – Joint Sealers.

PART 3 – EXECUTION

3.01 SUBGRADE PREPARATION

- A. Verify that all subgrade surfaces have been brought to proper elevation and meet the requirements for compaction as specified in Section 02200. Verify that all pipe trenches crossing pavement areas have been properly backfilled and compacted as specified in Section 02200.
- B. Provide subgrade compaction to a depth of 12 inches in conformance with Section 02200. All soil subgrade shall be compacted to 100 percent of maximum dry density.

3.02 PORTLAND CEMENT CONCRETE

- A. Saw cut edges of existing paving where new paving abuts existing. Provide an expansion joint between new and existing paving as per Section 03300 – Concrete.
- B. Installation of concrete base, finish course and curbs, including forming, placing, finishing, curing, etc., shall be as per Section 03300.

END OF SECTION 02500

SECTION 02800
SITE IMPROVEMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Wood Fences and Gate.

1.02 RELATED WORK

- A. Division 01010 – General Requirements.
- B. Section 02200 – Earthwork.
- C. Section 03300 – Cast-In-Place Concrete.
- D. Section 06100 – Rough Carpentry.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM).
- B. American Wood Preservers Association (AWPA).

1.04 SUBMITTALS

- A. Contractor's shop drawings for fabrication and installation as per this Section.
- B. Manufacturer's literature for items specified in this Section.

1.05 QUALITY ASSURANCE

- A. All site furnishings shall be delivered to site in undamaged condition.
- B. Protect all site furnishings from damage due to weather, construction, spills, etc., until final acceptance of work by Contracting Officer.
- C. Requirements for minimum soil compaction and bearing strength and inspection of footing and foundation excavations shall be as specified in Section 02200.
- D. Provide careful layout and control for all work and verify subgrade and finished surfaces as specified.

1.06 ENVIRONMENTAL CONSIDERATIONS

- A. Existing Site Features and Utilities:
 - 1. Protect trees, shrubs, lawns and other features remaining as a portion of final landscaping and part of existing adjacent properties off site.
 - 2. Protect bench marks, existing structures, sidewalks, paving and curbs and other features from damage during construction.
 - 3. Protect above and below grade utilities which are to remain.
 - 4. See Section 02950 for pruning of trees and shrubs to remain which have been disturbed by work of this section.

PART 2 – PRODUCTS

2.01 WOOD FENCE

- A. Size, shape, type of material, and finishes shall be as indicated on the drawing and/or as specified.
- B. All wood for fence shall be Western Red Cedar. Lumber shall be surfaced dry. All Wood members shall be AWPAC LP-2 and LP-22, No. 2 S4S. Refer to Section 06100 – Rough Carpentry.
- C. Concrete for post footings shall be 3,000 psi concrete and 4,000 psi concrete slab for AC unit and trash enclosure at 28 days as per Section 03300 – Cast-In-Place Concrete.
- D. All fasteners shall be hot-dipped galvanized.
- E. Stain:
 - 1. Section 09900 – Painting. Solid Brown Stain.
- F. Metal:
 - 1. Section 05500 – Metal Fabrications.
- G. Porch Post Mounting Bracket:
 - 1. Galvanized Steel mounting bracket set in concrete porch as per drawings.
 - 2. Manufacturer: Simpson-Strong-Tie Connections, 4637 Chabot Dr., Suite 200, Pleasanton, Ca 94588 or equal. Part No. CB44
 - 3. 5/8" galvanized bolts, nuts and washers.
- H. Fence Post Connection
 - 1. Galvanized steel bolts, nuts, and washers. See drawings.
- I. Fence Rail Connection to Post
 - 1. Galvanized steel fence bracket as per drawings.
 - 2. Manufacturer: Simpson-Strong-Tie Connections, 4637 Chabot Dr., Suite 200, Pleasanton, Ca 94588 or equal. Part No. FB24.

3. Galvanized fasteners: 8dx1 ½", 8d commons or #6 wood screws.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Layout and stake locations of site furnishings. Obtain approval of Contracting Officer prior to installation.
- B. Verify that all work affecting the work of this section has been satisfactorily completed prior to installation.
- C. Verify and clearly mark locations of new and existing underground utility lines prior to installation. Notify Contracting Officer if obstructions are encountered.

3.02 INSTALLATION

- A. Install site furnishings to manufacturer's instructions or as per drawings.
- B. Set site furnishings plumb, level and true to line.

3.03 WOOD FENCES

- A. Refer to Section 06100 – Rough Carpentry.
- B. Install as per drawings.

END OF SECTION 02800

This page was intentionally left blank for duplex printing.

SECTION 02936
SEEDING AND SODDING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Soil preparation and placing of topsoil.
- B. Fine grading.
- C. Fertilizing.
- D. Seeding
- E. Sod Installation.
- F. Mulching.
- G. Maintenance.

1.02 RELATED SECTIONS

- A. Section 02200 – Earthwork.
- B. Section 02950 – Trees, Plants, and Groundcover.

1.03 SUBMITTALS

- A. Submit seed vendor's certification for specified grass seed mixture, indicating percentage by weight, and percentages of purity, germination and weed seed for each grass species to Contracting Officer.
- B. Submit sod certification for grass species and location of sod source.
- C. Submit manufacturer's or vendor's certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.
- D. Submit three (3) typewritten instructions, to Contracting Officer, recommending procedures to be established by the Government for maintenance of landscape work for one full year. This submission shall include instructions for cutting methods and maximum grass height, and types, application intervals and recommended coverage of fertilizer.

1.04 QUALITY ASSURANCE

- A. Provide testing and analysis of topsoil by a qualified testing laboratory to determine percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value. Determine exact requirements for fertilizer mix and soil amendments.
- B. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging and location of packaging.
- C. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Contracting Officer, together with proposal for use of equivalent material.
- D. Tolerances for finished grades shall be as specified in Section 02200 – Earthwork.
- E. Package standard products with manufacturer's certified analysis.
- F. Sod shall be free of diseases, nematodes, and soil-borne insects. State nursery and/or plant materials laws require that all sod entering interstate commerce be inspected and approved for sale. The same applies to sod being shipped intrastate. The inspections and approval must be made by the State Agricultural Department, Office of the State Entomologist.

1.05 REGULATORY REQUIREMENTS

- A. Comply with applicable regulatory agencies for fertilizer and herbicide composition and application.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products in a manner to prevent wetting and deterioration.
- B. Deliver grass seed mixture and fertilizer in original unopened and undamaged containers. Products in damaged packaging are not acceptable
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.
- D. Deliver sod on pallets. Protect exposed roots from dehydration.
- E. Do not deliver more lawn sod than can be laid within 24 hours.
- F. Materials shall be stored in areas designated by the Contracting Officer. Sod shall be lightly sprinkled with water, covered with moist burlap, straw or other covering, and protected from exposure to wind and direct sunlight until planted. Covering for sod shall allow air to circulate and prevent internal heat from building up. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants. Chemical treatment materials shall not be stored with other landscape materials.

1.07 ENVIRONMENTAL CONDITIONS

- A. Protect existing utilities, paving and other facilities from damage caused by landscaping operations.
- B. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.
- C. The Contractor shall immediately clean paved and finished surface areas, remove all debris and excess materials from the project site and dispose of any protective barriers and warning signs upon final acceptance of work.

1.08 SCHEDULING

- A. Perform seeding and sodding only after other work affecting ground surface has been completed.
- B. Seasons for Seeding and Sodding:
 - 1. Spring Seeding and Sodding: Seed shall be sown and Sod shall be placed in the spring as soon as weather permits but no later than June 15.
 - 2. Fall Seeding and Sodding: Fall seeding and sodding is encouraged as the best time and operation should be as close to August 15 as possible and no later than October 15.
 - 3. At option and under full responsibility of the Contractor, seeding and sodding operations may be conducted under unseasonable conditions, but without additional compensation and only as approved by the Contracting Officer.
- C. Time Limitations: Sod shall be placed within 36 hours of harvesting.

1.09 WARRANTY

- A. Lawn shall be warranted through lawn maintenance period and until date of final acceptance.

PART 2 – PRODUCTS

2.01 SEED

- A. Grass seed shall be fresh, clean, new, standard grade seed of current or latest seasons crop and composed of the following varieties mixed in the proportions by weight shown. Seed shall be furnished in sealed, standard containers bearing the dealer's statement of composition of mixture and percentage of purity and germination of each variety. Seed shall be blue tag certified and labeled in accordance with U.S. Department of Agriculture.
- B. Furnish seed mixture labels from containers to Contracting Officer.

2.02 SEED MIXTURE

A.

<u>Seed Kind</u>	<u>By Weight (%)</u>	<u>Purity (%)</u>	<u>Germination (%)</u>
Creeping Red Fescue	15	98	85
Manhattan or Norlea Perennial Rye	20	98	85
Pennfine Perennial Rye	30	98	85
Glade Bluegrass	15	98	85
Baron Bluegrass	20	98	85

B.

Other Ingredients

Crop	0.00 percent
Inert Matter	1.49 percent
Weeds (none noxious)	0.5 percent maximum

2.03 SOD

A. Sod Classification: State-approved sod shall be provided as classified by applicable state laws. Each individual sod section shall be of a size to permit rolling and lifting without breaking.

B. Grass Species: Grass species shall be proportioned as follows:

<u>Botanical Name</u>	<u>Common Name</u>	<u>Mixture Percent</u>
Poa Pratensis	Kentucky Bluegrass	80
Lolium Perenne	Perennial Ryegrass	20

C. Quality: The sod shall be relatively free of thatch, diseases, nematodes, soil-borne insects, weeds, or undesirable plants, stones larger than two inches in any dimension, woody plant roots, and other material detrimental to a healthy stand of turf. Sod that has become dry, moldy, or yellow from heating, or has irregularly shaped pieces of sod and torn or uneven ends shall be rejected.

D. Thickness: Sod shall be machine cut to a uniform thickness of 1-1/4 inches within a tolerance of 1/4 inch, excluding top growth and thatch. Measurement for thickness shall exclude top growth and thatch.

E. Furnish sod in rolls of standard workable size that is not broken or stretched.

F. Before stripping, sod shall be mowed uniformly at a height of 2" to 2-1/2" on bluegrass.

G. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

H. Sod shall be relatively free of thatch, up to 1/2" allowable (unpressed).

I. Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard width and lengths shall be minus 1/2" on width and plus or minus 5% on length. Broken pads and torn or uneven ends will not be acceptable.

- J. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.
- K. Sod shall be free of objectionable grassy and broadleaf weeds. Sod shall be considered free of such weeds if less than five such plants are found per 100 square feet of area. Sod will not be acceptable if it contains any of the following weeds: common bermudagrass (wiregrass), quackgrass, johnson-grass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel, and brome grass.
- L. Sod shall be uniform in color, leaf texture, and density.
- M. Sod shall not be grown on peat.

2.04 TOPSOIL

- A. Obtain topsoil from on-site stockpiles. See Section 02200 – Earthwork. Topsoil shall be free of plants, roots, subgrade soil or other impurities and stones 1 inch or more in diameter.
- B. Imported Topsoil: Provide topsoil from off-site sources as required to complete the topsoil operation. All topsoil furnished from off-site sources shall be cleaned and shredded and consist of a natural fertile, friable soil possessing characteristics of representative of productive soils in the vicinity. It shall contain at least 2 percent and not more than 20 percent decayed organic matter (humus). It shall be obtained from naturally well-drained areas and shall not be excessively acid or alkaline nor contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be clean and free from clay lumps, stones, stumps, roots, or similar substances 1 inch or more in diameter, debris, or other objects which might hinder planting operations and shall not be delivered in a frozen or muddy condition. Topsoil shall have a minimum pH value of 5.4 and a maximum value of 7.0. Topsoil samples shall be approved by the Contracting Officer prior to incorporation in the work.

2.05 ACCESSORIES

- A. Fertilizer: Conforming to applicable regulatory agencies, uniform as to composition, dry, free flowing, and delivered to site in original unopened containers. Available nutrients, percent by total weight shall be determined by soils test.
 - 1. 50 percent of available nitrogen shall be organic (slow release).
- B. Soil Conditioning Materials:
 - 1. Aluminum Sulfate: Unadulterated, in manufacturer's original, unopened container labeled with analysis and not weight. Use to acidify soil (lower pH) as recommended by soils test report.
 - 2. Limestone: Raw, ground agricultural limestone, containing at least 90 percent calcium carbonate; 90 percent shall pass No. 10 sieve and 50 percent shall pass No. 50 sieve. Use to decrease acidity of soil (raise pH) as recommended by soils test report.

- C. Water: Contractor shall provide water from his own sources which is clean and free from substances harmful to plant growth. Provide hoses and other necessary means for proper distribution of water.
- D. Sod Anchors: Sod anchors shall be recommended by the sod supplier.

PART 3 – EXECUTION

3.01 GENERAL

- A. All lawn areas within the limits of construction and as noted on the drawings and all lawn areas disturbed by construction shall receive topsoil, fine graded, seeded or sodded.
- B. All finished lawn surfaces shall be sloped to drain. Surfaces that do not drain shall be regarded, reseeded or resodded to meet this requirement.
- C. Lawn areas and topsoil contaminated by foreign materials resulting from Contractor's operations, including oil drippings, stone, gravel, and other construction materials shall be removed and replaced with topsoil and seeded or sodded as specified.

3.02 INSPECTION

- A. Verify that prepared subgrade soil is properly placed, graded in conformance with the drawings and ready to receive the work of this section. Do not start work until conditions are satisfactory.
- B. Verify that elevations and locations of all manholes, valve covers, valve boxes and similar structures located within areas to be sodded are correct.

3.03 PLACEMENT OF TOPSOIL AND FINE GRADING

- A. Subgrade soil shall be loosened to a minimum depth of 2 inches by disking before applying topsoil.
- B. Topsoil shall not be placed when subgrade is excessively wet or frozen.
- C. Topsoil shall be distributed uniformly and spread evenly to a minimum thickness of 6 inches. Level surface irregularities to eliminate depressions and grade to proper surface configuration as shown on the drawings. Obtain topsoil from on-site stockpiles or, if required, from off-site sources at no additional cost.
- D. Lightly roll or tamp topsoil to form a firm soil bed. Do not create excessive compaction.
- E. Remove all stones over 1 inch with rotary rock rake or other suitable means prior to seeding or or sodding operations.
- F. Cultivate seed or sod bed as specified below.

G. Preparation of Unchanged Grades:

1. Where lawns are to be planted in areas that have not been altered or disturbed by excavating, or grading operations, prepare soil for lawn planting as follows: Till to a depth of not less than 6 inches; apply fertilizer as specified; remove high areas and fill in depressions; till soil to a homogeneous mixture of fine texture, free of lumps, clods, stones over 1 inch, roots and other extraneous matter.
2. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside the Government's property; do not turn over into soil being prepared for lawns.
3. Apply specified fertilizer at rates specified and thoroughly mix into upper 4 inches of topsoil. Delay application of fertilizer if lawn planting will not follow within a few days.

H. Areas where options have not been taken:

1. See 02200 for rough grading.
2. Place topsoil as noted above.
3. Fine grade and seed. Insure proper drainage of area.

3.04 INSTALLATION

A. Fertilizing:

1. Apply fertilizer uniformly at a rate of 16 pounds per 1,000 sq. ft. over areas to be seeded or sodded.
2. Incorporate fertilizer into the top 4 inches of topsoil by harrowing, disking or other acceptable method. Apply all fertilizer according to manufacturer's recommendations. Apply evenly avoiding overlap of distributed fertilizer. Do not over fertilize. Contractor shall be held responsible for all damage caused by over application of fertilizer and shall correct all such damage to the Contracting Officer's satisfaction and at the Contractor's expense.
3. The following fertilizer applications shall be followed: At the time of sodding apply 18-24-6 at a rate of 16 pounds per 1,000 sq. ft. One month after germination, apply 26-3-3 at a rate of 10 pounds per 1,000 sq. ft.

B. Seeding and Sodding:

1. Topsoil shall be cultivated to a depth of 4 inches immediately prior to seeding or sodding.
2. Plant lawn areas within 24 hours of soil preparation.
3. Perform seeding operations when the soil is dry and when winds do not exceed five (5) miles per hour velocity.
4. Apply seed with mechanical seed distributor or other methods approved by Contracting Officer. Install seed evenly by sowing equal quantities in two directions, at right angles to each other. Hydro seeding shall be permitted.
5. Sow grass seed mix at the rate of 5 lb. Per 1,000 sq. ft.
6. Seed shall be covered by lightly raking or by dragging with chain-barrow. Cultipacker or approved similar equipment may be used to cover the seed and firm bed in one operation.
7. If Hydro seeding is performed (approved by Contracting Officer), a uniform slurry of seed fertilizer and wood cellulose fiber shall be applied in one operation. The seed, fertilizer and mulch shall be mixed and sprayed on the soil at a rate of 35 pounds per 1,000 sq. ft.

8. During periods of higher than optimal temperature for species being specified and after all unevenness in the soil surface has been corrected, the soil shall be watered thoroughly within 48 hours prior to laying the sod.
9. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to insure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots. New sod shall be placed next to existing lawn areas, so that the new sod is at the same grade and butted tight to the edge of existing grass. Edge of existing grass shall be cut vertical and straight in line.
10. On slopes of 3:1 or greater, lay sod perpendicular to slope and secure every row with stakes placed 2'-0" on center maximum. Drive stakes flush with soil portion of sod.
11. Roll sod with roller weighing not more than 150 pounds per foot.
12. Sprinkle sod immediately after transplanting. Water sod and soil to depth of 4" within four hours after rolling.
13. Do not lay dormant sod or install sod on saturated or frozen soil.
14. Place boards over sodded areas to protect sod from construction traffic.
15. Topdress sod with topsoil and work into joints with broom or mat.

C. Mulching for Seeding:

1. Mulch shall be spread uniformly in a continuous blanket using 140 lb. (2 bales) straw per 1,000 sq. ft. or three tons per acre. Mulch may be applied by hand, or blower type spreader.
2. Immediately following spreading, mulch shall be firmly anchored with vertical disking or other suitable means as approved by the Contracting Officer.

D. Watering:

1. Water shall be distributed evenly and effectively, without damaging finished surfaces. Thoroughly soak lawn areas immediately after installation with fine mist spray until the ground is soaked to a depth of four (4) inches.

E. Reconditioning existing lawns:

1. Existing lawns damaged by Contractor's operations, including, storage of materials or equipment, and movement of construction vehicles, shall be restored as per this section.

3.05 MAINTENANCE

- A. The Contractor shall be responsible for proper care of seeded or sodded areas while grass is becoming established for as long as necessary to establish a uniform, weed-free stand of specified grasses acceptable to the Contracting Officer and until final acceptance of the entire project.
- B. Maintain grass areas to establish a full, uniform stand of grass free of weeds, undesirable grass species, disease, and turfgrass pests.
 1. Repair, rework, and reseed all areas that have washed out, eroded, or have not become established and replace undesirable or dead lawn areas as specified above.
 2. Mulch and seed that have been disturbed by wind, water, fire or other causes shall be replaced to re-establish the condition and grade of the area and shall then be re-fertilized, reseeded and re-mulched.

3. In the event seeding operations are completed too late in the fall for adequate germination and establishment, as determined by the Contracting Officer, maintenance shall continue into the following spring until acceptable.
4. Mow lawn areas as soon as lawn top growth reaches a height of 3-1/2 inches. Cut to 2-1/2 inch height. Repeat mowing as required to maintain specified height when grass height reaches 3-1/2 inches.
5. Apply herbicides as required to control weed growth or undesirable grass species.
6. Apply fungicides and insecticides as required to control diseases and turfgrass pests.
7. Water as required to maintain lawn. Provide water at a rate of 1/2" per week over the entire lawn area and apply as required to moisten soil to a depth of 4". This provision may be reduced by the amount of rainfall naturally occurring as long as it is sufficient to promote healthy turf growth.
8. Re-seeding or re-sodding of damaged areas shall require preparation and seeding or sodding methods as described in this section.
9. In the event sodding operations are completed too late in the season for adequate knitting with topsoil and root development as determined by the Contracting Officer, maintenance shall continue into the following growing season until acceptable.

3.06 ACCEPTANCE

- A. Inspection to determine acceptance of lawn areas will be made by the Contracting Officer, upon Contractor's request. Provide notification at least 10 working days before requested inspection date.
 1. Contractor shall be required to produce a satisfactory stand of perennial grass.
 2. Scattered bare spots, none of which is larger than one square foot will be allowed up to a maximum of 3 percent of the lawn area.
 3. Sodded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, even colored viable lawn is established, free of weeds, undesirable grass species, disease, and insects. The root system shall be sufficient to survive dry periods, winter weather, and be capable of re-establishing in spring.
- B. Upon acceptance of the entire project, the Government will assume lawn maintenance.

END OF SECTION 02936

This page was intentionally left blank for duplex printing.

SECTION 02950
TREES AND SHRUBS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Soil preparation and placing of topsoil.
- B. Plants and groundcover.
- C. Fertilizing.
- D. Mulching.
- E. Maintenance.

1.02 RELATED SECTIONS

- A. Section 02200 – Earthwork.
- B. Section 02936 – Sodding.

1.03 REFERENCES

- A. American National Standards Institute (ANSI).
 - 1. ANSI Z60.1: "American Standard for Nursery Stock."
- B. American Society for Testing Materials (ASTM).
 - 1. ASTM D-2607-69: Peat Moss

1.04 SUBMITTALS

- A. Certification: Submit certificates of inspection as required by Contracting Officer.
- B. Submit manufacturer's or vendor's certified analysis for fertilizer materials.
- C. Submit other data substantiating that materials comply with specified requirements.

1.05 QUALITY ASSURANCE

- A. Ship landscape materials with certificates of inspection required by Contracting Officer. Comply with regulations applicable to landscape materials.

- B. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to Contracting Officer together with proposal for use of equivalent material.
- C. Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory. Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
- D. For compliance with requirements of genus, species, variety, size and quality, the Contracting Officer may inspect shrubs at site before planting. Contracting Officer retains right to further inspect shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected shrubs immediately from project site.
- E. Plants of the same size species planted in close proximity shall be of uniform size and appearance.
- F. Plants larger than specified may be used if approved by the Contracting Officer, but use of such plants shall not increase the contract price. If the use of the larger plant is approved, the spread of the root ball shall be increased in proportion to the size of the plant.

1.06 REGULATORY REQUIREMENTS

- A. Comply with applicable regulatory agencies for fertilizer and herbicide composition and application.
- B. Comply with applicable regulatory agencies for shipment of plant materials.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Inspection certificates required by law shall accompany each shipment invoice or order to stock and on arrival, the certificate shall be filed with the Contracting Officer.
- B. Label each shrub with a securely attached waterproof tag bearing legible designation of botanical and common name.
- C. Deliver fertilizer in original, unopened waterproof bags showing weight, chemical analysis and name of manufacturer. Store in a manner to prevent wetting and deterioration.
- D. Spray deciduous plants in foliage with an approved anti-desiccant immediately after digging to prevent dehydration.
- E. Dig, pack, transport and handle plants with care to ensure protection against injury. Fully protect plants from damage by sun, wind, drought, water and other injurious conditions during transportation to site and during temporary storage before planting.
- F. Do not prune prior to delivery unless otherwise approved by Contracting Officer. Do not bend or bind-tie shrubs in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped stock during delivery.

- G. Deliver shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than six hours after delivery, set shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other means of retaining moisture acceptable to the nursery and Contracting Officer.
- H. Do not remove container grown stock from containers until planting time.

1.08 ENVIRONMENTAL CONDITIONS

- A. Determine location of and mark underground utilities prior to planting and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- B. When conditions detrimental to plant growth are encountered such as rubble fill, adverse drainage conditions, or obstructions, notify Contracting Officer before planting.
- C. Plant shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to Contracting Officer. If planting of shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.
- D. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.
- E. See Section 01560 – Temporary Controls for removal of damaged shrubs.

1.09 SCHEDULING

- A. Deciduous Plant Materials: Planting may be done from April 15 to June 15 or September 1 to October 31 if the weather and soil conditions are favorable or as otherwise authorized by the Contracting Officer and with the consent of the Contractor.
- B. Coniferous Plant Materials: Planting shall be done from April 15 to June 1 or August 15 to October 31.

1.10 WARRANTY

- A. Warranty shrubs through specified maintenance period and for a period of one year after date of final acceptance against defects including death and unsatisfactory growth, except for defects resulting from neglect by Government, abuse or damage by others or incidents which are beyond Contractor's control. Warrant plant material to remain alive and in a healthy, vigorous condition.
- B. Remove and replace shrubs or other plants found to be dead or in unhealthy condition during warranty period. Replace shrubs which are in doubtful condition at end of warranty period. Extend warranty period for an additional growing season for the replacement plants.

PART 2 – PRODUCTS

2.01 PLANT MATERIALS

- A. Provide shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard of Nursery Stock." Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
- B. Provide freshly dug shrubs.
- C. Shrubs: Provide shrubs of the height shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required. Provide balled and burlapped (B & B) shrubs. Container-grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to specified limitations for container grown stock.
- D. All plant materials shall be grown in same climatic zone as site they will be planted for a minimum of one year.

2.02 TOPSOIL

- A. As specified in Section 02936 – Sodding.

2.03 LANDSCAPE MATERIALS

- A. Commercial Fertilizer:
 - 1. Fertilizer shall conform to applicable regulatory agencies, be uniform as to composition, dry, free flowing, and delivered to site in original unopened containers.
 - 2. Minimum analysis by weight:
 - 10% N (Nitrogen)
 - 6% P₂O₅ (Phosphoric Acid)
 - 4% K₂O (Potash)
 - 3. 50% of nitrogen content shall be organic (slow release).
- B. Peat Moss: High quality peat moss meeting requirements of ASTM D-2607-69.
- C. Mulch: Shredded bark mulch free from deleterious materials and suitable for top dressing of shrubs or plants. Submit samples to Contracting Officer for approval.
- D. Water: Contractor shall provide from his own sources water which is clean and free from substances harmful to plant growth. Provide hoses and other necessary means for proper distribution of water.
- E. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

PART 3 – EXECUTION

3.01 SPECIAL REQUIREMENTS

- A. Pruning existing trees:
 - 1. Prune all existing trees damaged in any way by construction as required to compensate for such damage. Pruning shall be conducted as soon as the extent of damage can be adequately assessed.
 - 2. All pruning shall be done by a qualified professional arborist or tree surgeon. All work shall conform to commonly accepted horticultural trade standards. All work shall be coordinated with the Contracting Officer prior to execution.
 - 3. All existing dead or structurally weak trees or their parts which in any way threaten the safety of the building or persons using the project site shall be removed. Removal of such wood shall be coordinated with the Contracting Officer.
- B. Options:
 - 1. If a housing unit option is not taken, the planting with that unit is also not taken.

3.02 PREPARATION

- A. Lay out individual shrub locations and areas for multiple plantings. Stake locations and outline plant beds. Secure Contracting Officer's acceptance before start of planting work. Make adjustments to plant locations as directed by the Contracting Officer.
- B. Preparation of Planting Soil:
 - 1. Mix planting soil prior to backfilling and stockpile at site.
 - 2. Before mixing, clean topsoil of roots, plants, sod, stones, clay lumps, toxic materials and other extraneous materials.
 - 3. Mix planting soil as follows:
 - a. Deciduous material: Three parts topsoil to one part peat moss.
 - b. Coniferous material: Two parts topsoil to one part peat moss.
 - 4. Mix specified fertilizer with planting soil at the following rates:
 - a. Shrubs: One-half pound per shrub.
 - 5. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
- C. Preparation of Planting Beds:
 - 1. Excavate planting beds to a minimum depth of 18 inches.
 - 2. Spread planting soil mixture to minimum depth of 18 inches and as required to meet lines, grades and elevations shown, after light rolling and natural settlement. Place approximately 1/2 of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer, then place remainder of the planting soil.

D. Excavation for Shrubs:

1. Excavate pits and beds with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard, glazed subsoil in bottom and sides of excavation.
2. For balled and burlapped (B & B) shrubs, make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus 3 inches allowance for setting of ball on a layer of compacted backfill.
3. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.
4. Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use as backfill.
5. Fill excavations for shrubs with water and allow to percolate out before planting.

3.03 PLANTING

- A. Set balled and burlapped (B & B) stock on layer of compact planting soil mixture, plumb and in center of pit with top of ball at same elevation as adjacent finished landscape grades. Remove twine, wire cage and burlap from side of balls; retain burlap on bottom. When set, place additional planting soil backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3-full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed.
- B. Set container grown stock as specified for balled, burlapped stock. Cut cans on two sides with an approved can cutter and remove.
- C. Care shall be taken that plants, when planted, are not buried deeper than in the nursery or exposed above finished grade higher than in the nursery. Reset plants as required.
- D. Planting shall not be carried out in water logged or frozen soil.
- E. Dish top of backfill to allow for mulching.
- F. Mulch pits and planted areas as shown on the drawings.
- G. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage. If shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving and again two weeks after planting.
- H. Pruning:
 1. Each tree shall be pruned in accordance with the American Nurserymen Association Standards to preserve the natural character of the plant and as approved by the Contracting Officer.
 2. All dead wood or suckers and all broken or badly bruised branches shall be removed.
 3. Remove and replace excessively pruned or misformed stock resulting from improper pruning.

3.04 MAINTENANCE

- A. Begin maintenance immediately after planting.

- B. Maintain shrubs and other plants until final acceptance of the project but in no case less than the following period:
 - 1. 60 days after substantial completion of planting.
- C. For new plants within 50 feet of new housing units, water plantings in a satisfactory manner during and immediately following planting, twice per week, or less under wet conditions, for a period not to exceed one year or until acceptance by the Government, whichever is the lesser.
- D. For new plants beyond 50 feet of new housing units, water plants in a satisfactory manner during and immediately following planting, twice per week, or less under wet conditions, for a period not to exceed one year. Provide additional watering during excessively dry periods during the maintenance period as directed by the Contracting Officer.
- E. Maintain shrubs and other plants by watering, pruning, cultivating and weeding as required for healthy growth and attractive appearance. Restore planting saucers. Reset and restaked shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep shrubs free of insects and disease.

3.05 CLEANUP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

3.06 INSPECTION AND ACCEPTANCE

- A. When landscape work is completed, including maintenance, Contracting Officer will, upon request, make an inspection to determine acceptability.
- B. When inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Contracting Officer and found to be acceptable. Remove rejected plants and materials promptly from project site.

END OF SECTION 02950

This page was intentionally left blank for duplex printing.

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide cast-in-place concrete as shown and specified. Work includes:
 - 1. Slabs-on-grade.
 - 2. Formwork, steel reinforcement and accessories.
 - 3. Field quality control testing.
- B. Related Sections:
 - 1. Section 02200 – Earthwork: Granular base.

1.02 SUBMITTALS

- A. Submit laboratory test reports for concrete materials and mix designs for each class of concrete required. Obtain acceptance before placing concrete.
- B. Reinforcement shop drawings: Submit detailed shop drawings for fabrication, bending and placement of concrete reinforcement. Show number, size, spacings, location and quantities required. Comply with ACI-315.

1.03 QUALITY ASSURANCE

- A. Standards:
 - 1. American Concrete Institute (ACI):
 - a. ACI 301 "Specifications for Structural Concrete for Buildings."
 - b. ACI 305 "Hot Weather Concreting."
 - c. ACI 306 "Cold Weather Concreting."
 - d. ACI 315 "Details and Detailing of Concrete Reinforcement."
 - e. ACI 318 "Building Code Requirements for Reinforced Concrete."
 - f. ACI 347 "Recommended Practice for Concrete Formwork."
 - g. ACI SP-15 "Field Reference Manual."
- B. Provide for and control quality of all materials and workmanship, including the workmanship and material furnished by his subcontractors and suppliers.
- C. Correct work which does not conform to specified requirements including strength, tolerance requirements, finishes, etc. Correct non-conforming work in a manner acceptable to the Contracting Officer. The cost of extra work incurred to review and accept corrective work shall be borne by the Contractor.

- D. Provide and pay for laboratory design services, materials evaluation testing and inspection services during concrete operations.
- E. Layout: Establish and maintain accurate reference points for all concrete surfaces and elevations.
- F. Maintain field records of time, date of placing, curing and removal of forms of concrete in each portion of work.

1.04 PROJECT CONDITIONS

- A. Do not install footing concrete before inspection and acceptance of bearing surfaces.
- B. Protect completed footing level concrete work and subgrade with sufficient temporary or permanent coverings as required to protect footings and adjacent subgrade against freezing. Maintain protection in place until weather conditions permit removal.

PART 2 – PRODUCTS

2.01 CONCRETE FORMWORK

- A. Wall Forms: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in large practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
- B. Forms for Slabs on Grade: Lumber, No. 2 common or better by thickness required; steel forms acceptable.
- C. Form Release Agent: Clean water or non-staining chemical form release agent free of oils, waxes and other materials harmful to concrete.
- D. Form Ties: Adjustable length, such that when ties are removed, ties leave no metal within 1 inch of finished surface. Tie holes shall leave holes not less than 1/2 inch nor move than 1 inch in depth.

2.02 CONCRETE REINFORCEMENT

- A. Reinforcing Bars:
 - 1. Material: Steel, free of rust and dirt.
 - 2. Manufacturing Standard: ASTM A615.
 - 3. Minimum Grade: 60.
 - 4. Sizes and Extent of Work: See drawings.
- B. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place.

C. Wire Mesh:

1. Material: Cold drawn steel wire.
2. Manufacturing Standard: ASTM A185.
3. Condition: Flat sheets.
4. Size, unless otherwise shown on drawings:
 - a. Mesh: 6 by 6 inches
 - b. Wire: W1.4 by W1.4.
5. Extent of Work: Provide in all concrete flatwork, unless otherwise indicated on drawing details.

D. Reinforcement Accessories:

1. Tie Wire: 16 gauge black annealed steel.
2. Material: Concrete, ceramic, plastic, or metal. Hot-dip galvanized any metal accessories adjacent to exposed concrete surfaces.
3. Manufacturing Standard: Manual of Standard Practice, published by Concrete Reinforcing Steel Institute.
4. Extent of Work: Provide all accessories necessary for proper reinforcement placement, spacing, support, and fastening.

2.03 VAPOR BARRIER

- A. Material: Polyethylene film not less than 6 mils thick, natural color, resistant to deterioration in accordance with ASTM E154.

2.04 CONCRETE MATERIALS

- A. Portland Cement: Portland cement, ASTM C150, Type V having a tricalcium aluminate content of less than 5 percent, or meeting the optional physical requirement for sulfate expansion for Type V cement on Table 4, ASTM C150 may be used, or Type II blended with pozzolan meeting the requirements of ASTM C618, Type F. Cement meeting the optional chemical requirements for low-alkali cement per Table 2 of ASTM C150 is applicable for all concrete. Use Portland cement made by a well-known acceptable manufacturer and produced by not more than one plant for duration of project. Minimum cementitious content shall be the following: 564 pounds for 4000 psi air-entrained concrete; and 423 pounds for 3000 psi non air-entrained concrete.
- B. Aggregate:
1. Standard: ASTM C33; coarse aggregate of crushed limestone or river gravel; fine aggregate of clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances, unless otherwise indicated on drawing details.
 2. Coarse Aggregate Maximum Size: 1-1/2 inch and not more than one-fifth of narrowest dimension between sides of forms, one-third of depth of slab, nor three-fourths of narrowest space between reinforcing bars.

C. Admixtures:

1. Air-entraining admixtures shall conform to the requirements of ASTM C260. Euclid Chemical Co. "Air-Mix", W.R. Grace "Darex ARA," Master Builders Co. "MB-VR or MB-AE," and Sika Chemical Corp., "Sika AER" are acceptable air-entraining admixtures.
2. Water-reducing, retarding admixture shall conform to the requirements of ASTM C494, Type D with not more than 0.05 percent chloride ions. Euclid Chemical Company's "Eucon WR-75," Master Builders "Pozzoloth Retarder," W. R. Grace and Co. "Daratard 17," and Sika Chemical Co. "Plastiment" are acceptable water reducing admixtures.
3. High-range water reducing admixture (Super Plasticizer) shall conform to the requirements of ASTM C494, Type F or Type G, containing not more than 0.5 percent chloride ions. "Eucon 37" of Euclid Chemical Company, "Sikament 300" of Sika Chemical Company, "WRDA 19" of the W. R. Grace Co., and "Rheobuild" of Master Builders are acceptable high-range water reducing admixtures.
4. Fly ash shall conform to ASTM C618 Type C with 5 percent maximum loss on ignition. Fly ash may be used in all concrete. Amount of cement replaced by the use of fly ash shall not exceed 15 percent of the total cement content by weight.
5. Calcium chloride admixtures shall not be used. No admixtures shall be used that result in a total chloride ion content in excess of 0.15 percent of the weight of cement in the concrete. Provide written certification of the chloride ion content meets the above mentioned criteria.

2.05 CONCRETE MIXES

A. General:

1. Ready-mix type conforming to ASTM C94.
2. Assume responsibility for mix design and product performance. Course/fine aggregate ratio shall be 50/50.
3. Provision of durability (entrained air and maximum water-cement ratio shall be applicable to 4,000 psi class of concrete. This class of concrete shall be used whenever concrete is exposed to the weather in the finish structure and exterior slabs-on-grade.

- B. Design Strength: For concrete of 4000 psi compressive strength, the water-cementitious ratio shall not exceed 0.45 absolute ratio by weight. For interior concrete slabs on grade, provide concrete of minimum 3000 psi compressive strength with 0.45 water-cementitious ratio. For concrete used for foundations (unexposed to the weather), provide concrete of minimum 3000 psi compressive strength with 0.65 water-cementitious ratio in accordance with ACI recommendations. Follow ACI 301 recommended water-cementitious ratios for concrete with compressive strengths greater than or equal to 4000 psi.

- C. Maximum Slump: Proportion and design mixes to result in concrete slump at the point of placement as follows:

1. Reinforced systems: Not less than 3 inches, not more than 5 inches.
2. Concrete containing HRWR (Super plasticizer): Not more than 8 inches after the addition of an approved HRWR to the design mix. Verify consistently a 2 inch slump prior to the addition of HRWR. Note: Precautions must be taken to mix HRWR concrete completely prior to placement. Superplasticizer not permitted in flatwork.

2.06 CONCRETE ACCESSORIES

- A. Expansion Joint Filler:
 - 1. Material: Bituminous impregnated fiberboard.
 - 2. Manufacturing Standard: ASTM D1751.
 - a. Thickness: See drawings.
 - b. As required to position filler top 1/4 inch below slab top.
- B. Curing Compounds: Conform to the requirements of ASTM C309 Type I, Class B, and Federal Specification TT-C-800; compounds shall contain a minimum of 30 percent solids, without waxes or organic salts, with moisture loss not in excess of 0.35 kg/sq m. Standard: "Masterseal 200W" as manufactured by Master Builders, Inc., "Super Diamond Clear VOX" as manufactured by Euclid Chemical Co., and "Dress and Seal WB 30" as manufactured by L & M Construction Chemicals, Inc. or an approved equal.

PART 3 – EXECUTION

3.01 FORMWORK

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
 - 1. Provide Class A tolerances for concrete surfaces exposed to view.
 - 2. Provide Class C tolerances for other concrete surfaces.
- B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.
- D. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- E. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- F. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete after every concrete placement. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.02 INSTALLATION: VAPOR RETARDER

- A. Install a single layer of membrane vapor retarder material over level compacted base at interior slab-on-grade.
- B. Lap joints at sheet ends and edges a minimum of 6 inches. Turn up at perimeter surfaces and secure vertical surfaces to walls and column bases; fold corners. Provide sealed contact with piping, conduit and all other penetrating items.
- C. Trim exposed vapor retarder at floor line after concrete is placed and has cured and hardened.

3.03 PLACING REINFORCEMENT

- A. Clean oil, mud, loose rust and scale from steel before concrete is placed. Place in strict accordance with the drawings. Locate accurately and secure in forms.
- B. Provide supervision during placing of concrete and reset displace work into proper alignment.
- C. Install wire mesh in all exterior slabs on grade, set 2 inches below slab surface, or as indicated, using 6 x 6 – W1.4 x W1.4 mesh, unless otherwise indicated. Lap adjoining pieces one full mesh and tie splices with 16 gauge wire. Offset end laps in adjacent widths to prevent continuous laps.

3.04 JOINTS

- A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure.
- B. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, and other locations, as indicated.

3.05 PREPARING FORM SURFACES

- A. Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.
- B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.
 - 1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.06 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

- B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.
- D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.
- E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
 - 1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position on chairs during concrete placement.
- F. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- G. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Associate.

3.07 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

3.08 MONOLITHIC SLAB FINISHES

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified.
 1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill low spots. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- B. Trowel Finish: Apply a trowel finish to all monolithic slab surfaces except where non-slip finish is required.
 1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.
- C. Nonslip Broom Finish: Apply a nonslip broom finish to patio slabs, steps, sidewalks, driveways, porches, trash enclosure slabs, other exterior flatwork, and elsewhere as indicated.
 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.09 CONCRETE CURING AND PROTECTION

- A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
- C. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.
- D. Provide moisture curing by the following methods:
 - 1. Keep concrete surface continuously wet by covering with water.
 - 2. Use continuous water-fog spray.
 - 3. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4 inch lap over adjacent absorptive covers.
- E. Provide moisture-retaining cover curing as follows:
 - 1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches (75 mm) and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- F. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
 - 1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
- G. Curing Formed Surfaces: Cure formed concrete surfaces by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- H. Curing Unformed Surfaces: Cure unformed surfaces, including slabs and other flat surfaces, by applying the appropriate curing method.
 - 1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

3.10 REMOVING FORMS

- A. General: Formwork not supporting weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

3.11 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms.
- B. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.
 - 1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
- C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of the Contracting Officer. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

3.12 FIELD QUALITY CONTROL

- A. Provide field quality control testing and inspection during concrete operations in accordance with ACI 301.
- B. Submit proposed mix designs of concrete to the Contracting Officer for review prior to commencement of the work.
- C. Sampling and testing for quality control during concrete placement includes the following:
 - 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
 - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and one test for each set of compressive-strength specimens.

- d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
- e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

D. Furnish copies of field records and test reports as follows:

- 1. Two copies to Contracting Officer.
- 2. One copy to Contractor.
- 3. One copy to ready mix supplier.

END OF SECTION 03300

This page was intentionally left blank for duplex printing.

SECTION 03930

CONCRETE GARAGE SLAB MUDJACKING

GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

Drill holes into existing garage concrete slabs (30 total) fill voids underneath concrete garage slab with approved material and raise slab to original elevation. Each slab is approximately 300 square feet in area. See Bidding Schedule (Section 00010-3) for Buildings classified as Basic Bid and Option Bid.

<u>Address</u>	<u>Work Condition</u>
▪ 1887A "I" Street	Mudjack
▪ 1887B "I" Street	Remove and Replace
▪ 1891A "I" Street	No Work Required
▪ 1891B "I" Street	No Work Required
▪ 1893A "I" Street	Mudjack
▪ 1893B "I" Street	No Work Required
▪ 1899A "I" Street	Mudjack
▪ 1899B "I" Street	Occupied
▪ 1905A "I" Street	Mudjack
▪ 1905B "I" Street	Remove and Replace
▪ 1909A "I" Street	Mudjack
▪ 1909B "I" Street	Mudjack
▪ 1911A "I" Street	No Work Required
▪ 1911B "I" Street	Mudjack
• 1883A "I" Street	Mudjack
• 1883B "I" Street	Mudjack
• 1885A "I" Street	Occupied
• 1885B "I" Street	No Work Required
• 1889A "I" Street	Mudjack
• 1889B "I" Street	No Work Required
• 1895A "I" Street	No Work Required
• 1895B "I" Street	No Work Required
• 1897A "I" Street	Mudjack
• 1897B "I" Street	Mudjack
• 1901A "I" Street	Mudjack
• 1901B "I" Street	No Work Required
• 1907A "I" Street	No Work Required
• 1907B "I" Street	Mudjack
• 1913A "I" Street	Mudjack

Related Sections include the following:

1. Division 2 Section "Selective Demolition."
2. Division 3 Section "Cast-in-Place Concrete."

SUBMITTALS

A. Inspection Report: Submit an inspection report incorporating the following information:

1. Address of each concrete garage slab.
2. Existing condition of each concrete garage slab.
3. Recommendation of scope of work required based on the following information and findings:
 - a. Concrete slab is in reasonable condition and no work will be required.
 - b. Concrete slab should be mud jacked to the original slab elevation and the slab is in reasonable mudjackable condition.
 - c. Concrete slab should be removed, hauled off, new granular fill placed and compacted and a new 6 inch thick, cast-in-place concrete slab be placed because the existing slab is not in a non-mudjackable condition.

Qualification Data: For mud jacking company to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.4 PREINSTALLATION CONFERENCE

- A. Convene a preinstallation conference one week prior to commencing work of this Section.
- B. Require attendance of parties directly affecting work of this section.
- C. Review conditions of installation, installation procedures, and coordination required with related work.

PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 1. Material to be used to fill voids below garage concrete slabs.

EXECUTION

3.1 EXAMINATION

- A. Inspect each garage slab and notify Architect of scope of work required for each existing garage slab based on Submittal Inspection Report.

END OF SECTION 03930

This page was intentionally left blank for duplex printing.

SECTION 04200

MASONRY AND MORTAR

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Concrete masonry units
- B. Masonry-cell insulation

1.02 RELATED DOCUMENTS/SECTIONS

- A. Section 01010 – General Requirements
- B. Section 01300 – Submittals: Submission of Manufacturers' data.

1.03 QUALITY ASSURANCE/ CONTROL OF INSTALLATION

- A. Protection and Storage
 - 1. All materials shall be delivered in an undamaged and usable condition and shall be stored off the ground and protected from rain, snow, or standing water.
 - 2. All materials not properly stored and all walls not properly protected shall be immediately removed from the site if, in the judgment of the Architect, the material or wall is damaged.
 - 3. All chipped, cracked, stained, frozen, or otherwise damaged or rejected materials shall be promptly removed from the job site.
- B. Environmental Conditions
 - 1. Masonry work shall not be done when the temperature is below thirty-six (36) degrees F. and falling. Work may be done if the temperature is at least twenty-eight (28) degrees F. and rising.
 - 2. All masonry work shall be maintained above thirty-two (32) degrees F. for not less than 48 hours after initial construction. The general contractor shall provide temporary heat and temporary enclosures as required to maintain these minimum temperature conditions.
- C. Workmanship
 - 1. These specifications call for the highest quality masonry work.
 - 2. Only highly skilled and experienced craftsmen shall be employed to execute this work.

1.04 REFERENCE STANDARDS

- A. The following published reference standards shall be incorporated into this specification.

1. American Society for Testing and Materials; standard specifications (latest editions) noted throughout this specification.
2. "Recommended Practices for Laying Concrete Block", latest edition, Portland Cement Association.

PART 2 – PRODUCTS

2.01 CONCRETE MASONRY

- A. Hollow Non-Load Bearing Units
 1. All non-load bearing partitions may be constructed from units that conform to ASTM C129, "Standard Specification for Non-Load Bearing Concrete Masonry Units", Type 1, moisture controlled.
 2. All units shall be Type 1, moisture controlled, and Grade "N".
 3. Aggregates for all units shall conform to ASTM C331, "Standard Specification for Lightweight Aggregates for Concrete Masonry Units".
 4. Exposed blocks shall be modular 8" x 16" face size, except as noted or required.

2.02 INSULATION

- A. Hollow Concrete Masonry Insert Insulation
 1. All concrete masonry units noted to be insulated shall have factory-installed inserts of expanded polystyrene insulation having a minimum density of 1.3 pcf.
 2. Acceptable Products:
 - a. Korfil block insulation.

2.03 MORTAR AND GROUT MATERIALS

- A. Cement
 1. Shall conform to ASTM C150, "Standard Specification for Portland Cement", Type 1.
- B. Lime
 1. Shall conform to ASTM C207, "Standard Specification for Hydrated Lime for Masonry Purposes", Type "S".
- C. Aggregate
 1. Shall conform to ASTM C144, "Standard Specification for Aggregate for Masonry Mortar".
 2. Aggregate shall be limited to natural sand.

- D. Mortar Color
 - 1. Mortar color shall be:
 - a. Soloman Grind-Chem Service Concentrated Mortar Color.
 - 2. The Architect will select colors from ("A" or "H") series.

PART 3 – EXECUTION

3.01 GENERAL

- A. Layout
 - 1. Do not accept former measurements.
 - 2. Use story rod to check vertical coursing.
 - 3. Vertical dimensions have been calculated according to the following:
 - a. Concrete masonry: 2 blocks equal to 16".
- B. Bonding and Joint Finishing
 - 1. All exterior joints shall be tooled concave as laid with 1-1/8" diameter striking tool radius.
 - 2. Exposed concrete masonry shall be laid in running bond.
 - 3. Interior joints shall be tooled concave.
- C. Mortar Proportions and Properties:
 - 1. For Concrete Masonry, Type "S" mortar, (1800 psi average 28th day compressive strength)

1 cu. ft. Portland Cement	(94 lbs.)
1/2 cu. ft. Hydrated Lime	(20 lbs.)
4 cu. ft. Damp, Loose Sand	(320 lbs.)

3.02 MORTAR MIXING AND HANDLING

- A. All mortar shall be accurately proportioned and mixed in a power, drum-type mixer for 3 to 5 minutes after all ingredients have been placed in the mixer.
- B. Mortar shall not be retempered.
- C. Mortar shall not be used after it has stiffened nor after these time limits have expired:
 - 1. 1-1/2 hours after mixing when the ambient air temperature is 80 degrees F. or above.
 - 2. Two hours after mixing when the ambient air temperature is less than 80 degrees F.
- D. Colored mortar shall be mixed in strict compliance with the manufacturer's printed directions and shall be consistent in proportion and uniform in color throughout the job.

3.03 CO-OPERATION WITH OTHER TRADES

- A. Notify and consult with other trades in advance of masonry work to provide for installation of their work.
- B. Chasing of exposed masonry shall not be permitted. Conduits, piping and other work shall be built-in as masonry work progresses.
- C. All cutting and patching of masonry required by other trades shall be done by the masonry contractor.

3.04 WORKMANSHIP

- A. Use masonry saw to cut all exposed units.
- B. Isolate masonry units from steel columns with building paper or compressible filler.
- C. Vertical and horizontal joints shall be 3/8" wide.

3.05 INSULATION

- A. Insulate all exterior wall block cells.

3.06 PARGING

- A. Parge predampened masonry walls, where indicated, with Type S or Type N mortar applied in 2 uniform coats to a total thickness of 3/4 inch (19 mm). Scarify first parge coat to ensure full bond to subsequent coat.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot (3 mm per 300 mm). Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect the parging until cured.

3.07 CLEANING

- A. Keep all work as clean as possible and remove excess mortar and droppings daily.
- B. Do not use acid on concrete masonry surfaces. Clean with trowel and brush after droppings are dry.

END OF SECTION 04200

SECTION 05500
METAL FABRICATIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated metal items including the following items:
 - 1. Exterior access ladders at basement egress windows.
 - 2. Exterior corrugated metal area wells and plastic covers.
 - 3. Exterior stair metal handrails and guardrails.

1.02 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Furnish metal fabrications to be cast into concrete to Section 03300 – Cast-In-Place Concrete.

1.03 RELATED SECTIONS

- A. Section 03300 – Cast-In-Place Concrete.

1.04 OPTIONS

- A. Refer to Section 01010 – General Requirements for work of this Section performed under options.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01300 – Submittals.
- B. Submit shop drawings for fabrication and erection of metal fabrications. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Provide template for anchor and bolt installation by other trades.
 - 1. Show all field connections and field measurements.
 - 2. Do not proceed with fabrication before shop drawings acceptance.
 - 3. Comply with ANSI A14.3 requirements for fixed ladders.
- C. Include erection drawings, elevations, and details where applicable.
- D. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld length.
- E. Include manufacturer's written information and shop drawings for plastic area well covers.

1.06 QUALITY ASSURANCE

- A. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Preassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Welding: Comply with American Welding Society (AWS) "Structural Welding Code." Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle metal fabrications to prevent damage and deterioration. Protect from damage after installation.

1.08 PROJECT CONDITIONS

- A. Verify at the project site conditions affecting work of this section, and obtain accurate dimensions for incorporation in shop drawings submitted before fabrication of the work.
- B. Coordinate delivery of anchor bolts and other anchorage devices to be built into other work, to avoid delay. Furnish templates as required for accurate locations.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Metal Surfaces: For fabrication of work exposed to view, use only materials which are smooth and free of surface blemishes, including pitting, seam marks, roller marks, and roughness. Remove such blemishes before cleaning, treating and application of surface finishes.
- B. Carbon Steel Products:
 - 1. Steel Plates, Shapes and Bars: ASTM A36.
 - 2. Steel Pipe: ASTM A53, Grade B, standard weight.
 - 3. Galvanized Steel Sheet: Commercial quality ASTM A526 with ASTM A525, G90 zinc-coating.
 - 4. Malleable Iron Castings: ASTM A47, Grade 32510.
- C. Welding Materials: Comply with AWS D1.1; AWS D1.3 for welding base metals less than 1/8 inch thick, type required for materials being welded.
- D. Fasteners: Provide stainless steel or zinc-coated fasteners for exterior use or fastening to exterior walls. Select fasteners for the type, grade and class required. Provide expansion type devices for masonry and concrete anchorage. Toggle bolts may be used for anchorage at hollow masonry cores. Provide bolts and nuts, lag bolts and machine screws as required for rigid, secure anchorage of materials.
 - 1. Bolts, Nuts, and Washers: ASTM A307, Grade A.

2. Drilled Anchors: FF-S-325, Type 3, Class 3 and Group II, Type 4, Class 1; zinc-plated in accordance with FS QQ-Z-325, Type II, Class 3. Standards:
 - a. Red Head Sleeve Anchors; ITT Phillips Drill Div., Michigan City, IN.
 - b. HDI Drop-In Anchors; Hilti, Inc., Tulsa, OK
 - c. Molly Parabolts or Parasleeves; Molly Fastener Group/Emhart, Temple, PA.
- E. Touch-up Primer for Galvanized Surfaces: FS TT-P-645, zinc rich primer paint.
- F. Galvanized Finishes:
 1. ASTM A153 for galvanizing iron and steel hardware.
 2. ASTM A123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strips 1/8 inch thick and heavier.

2.02 FABRICATION

- A. Shop fabricate items complete and ready for installation. Fabricate metal items of material, size, and thickness indicated as required to produce the strength and durability in the finished assembly for the use intended. Work to the dimensions shown on approved shop drawings. Use type of materials shown or specified for various components of the work. Meet structural requirements considered structural in nature.
- B. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch unless otherwise shown. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.
- C. Weld shop connections, except as otherwise indicated. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Use concealed fasteners wherever possible. Provide phillips flathead (countersunk) screws or bolts for exposed fasteners unless otherwise indicated or specified.
- E. Prepare metal work for anchorage of the type indicated, coordinated with the supporting structure. Fabricate and space anchoring devices as indicated or as required to provide adequate support of the intended use of the work.
- F. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finish hardware and other appurtenant items.
- G. Drill or punch all holes required for attachment of work of other trades and for bolted connections. Burned holes are not acceptable.
- H. Fabricate joint which will be exposed to the weather in a manner to exclude water.

2.03 FINISH

- A. Provide a galvanized finish for those items shown or specified to be galvanized in accordance with ASTM A123 and ASTM A153.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, supporting structure and installation conditions. Do not proceed with metal fabrication installation until unsatisfactory conditions have been corrected.
- B. Installation constitutes acceptance of existing conditions and responsibility of satisfactory performance.

3.02 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates and instructions for installation of anchorages which are required to be cast into concrete construction.

3.03 INSTALLATION

- A. Provide anchorage devices and fasteners necessary for securing metal fabrications to in-place construction; including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
 - 1. Conceal fasteners whenever possible.
 - 2. Secure metal to wood with lag screws of adequate size, with appropriate washers.
 - 3. Secure metal to concrete with embedded anchors, sleeves, setting components or setting grout.
 - 4. Use expansion bolts, toggle bolts or screws for light duty service only.
 - 5. Provide all fabricated items complete with attachment devices required for installation.
- B. Perform cutting, drilling and fitting required for installation of metal fabrications. Set work accurately in location, alignment and elevation, plumb, level true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections which are not to be left as exposed joints. Grind exposed joints smooth and touch-up with galvanized touch-up primer paint. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dipped galvanized after fabrication and are intended for bolted or screwed field connections.
- D. Install plastic area well cover over each area well as indicated in the manufacturer's written instructions.

3.04 SCHEDULE

- A. Provide and install items listed in Schedule and shown on Drawings with anchorage and attachments necessary for installation.
- B. Access Ladders: Steel, all welded construction.

1. Fabricate for the locations indicated, length and anchorages as required to suit installation conditions and to comply with ANSI A14.3 requirements.
 2. Siderails: Continuous steel flat bars, 3/8 inch x 2-1/2 inches, with eased edges, spaced 16 inches apart.
 3. Bar rungs; Round steel bars, 3/4 inch diameter as detailed, spaced 12 inch on center. Fit rungs in centerline of side rails plug weld and grind smooth on outer rail fences.
 4. Support each ladder at top and bottom and at intermediate points spaced not more than 6'-0" on center by means of welded or bolted steel brackets. Size brackets to support required design dead and live loads and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
 5. Provide exterior access ladders hot-dipped galvanized.
- C. Corrugated Metal Area Wells: ASTM A446, Grade E, G60 zinc-coated according to ASTM A525. Manufacturer's standard design with return flanges and seamed lip.

END OF SECTION 05500

This page was intentionally left blank for duplex printing.

SECTION 06100
ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide rough carpentry work as shown and specified. Work includes but is not limited to the following:
 - 1. Wood framing including joists, studs, plates, nailers, and lintels.
 - 2. Plywood sheathing panels.
 - 3. Concealed blocking for support of accessories, equipment, fixtures, specialty items, trim and facing materials.
 - 4. Rough hardware and accessory materials.

1.02 SUBMITTALS

- A. Treatment Certification: Provide treatment plant certification of each type of wood treatment required stating process and chemicals used and conformance with specified standards.

1.03 QUALITY ASSURANCE

- A. Lumber: Comply with DOC PS-20-94, American Softwood Lumber Standard. Provide lumber species grade marked and complying with grading rules of following associations.
 - 1. Southern Pine: 1994 Standard Grading Rules for Southern Pine Lumber, published by Southern Pine Inspection Bureau (SPIB).
 - 2. Douglas Fir, Western Larch and Hemlock: Western Lumber Grading Rules, 1991 with May 1993 Supplement (No. 3) published by Western Wood Products Association (WWPA); or Standard Grading Rules for West Coast Lumber, Number 17, 1991, published by West Coast Lumber Inspection Bureau (WCLIB).
 - 3. Western Spruce, Pine and Fir: Western Spruce-Pine-Fir Association (WSPFA) and current Standard Grading Rules for Canadian Lumber (1994) by National Lumber Grades Authority.
- B. Plywood: Grade marked and manufactured in accordance with PS-1 or one of American Plywood Association (APA) performance standards.
 - 1. Install in accordance with APA Design/Construction Guide: "Residential and Commercial," Form No. E30P (April 1996).

1.04 DELIVERY, STORAGE AND HANDLING

- A. Keep materials dry during delivery and site storage. Protect against weather exposure and contact with damp or wet surfaces. Stack rough carpentry materials to ensure proper drainage and ventilation. Protect from weather damage and deterioration.
- B. Store and protect rough carpentry accessories and hardware from weather damage and deterioration.
- C. Store treated wood and plywood materials in areas where moisture content can be maintained. Handle treated materials and repair penetration damage in accordance with AWWA M4.

1.05 PROJECT CONDITIONS

- A. Coordination: Fit rough carpentry work to other work. Scribe and cope as required for accurate fit. Coordinate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Lumber:
 - 1. Nominal lumber sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS-20 for moisture content specified for each use.
 - 2. Provide dressed seasoned dimensioned lumber, S4S, air-dried with maximum 19 percent moisture content (S-DRY).
 - 3. Provide pressure preservative treated materials for exterior use or as indicated for interior use.
 - 4. Grades: Southern Pine or Western Lumber species.
 - a. Joists: No. 2.
 - b. Studs 10 feet and shorter: Stud.
 - c. Studs Longer than 10 feet: No. 2.
 - d. Furring, Blocking and Bracing: Utility.
 - 5. Exposed framing lumber (2 inches through 4 inches thick): Where framing will not be concealed by other work, provide Southern Pine, appearance grade or Douglas Fir, appearance framing.
- B. Performance-rated Structural Panels. Provide in thickness indicated.
 - 1. Floor sheathing: APA RATED PLYWOOD SHEATHING EXP 1, span rating 32/16, Tongue and groove edge, 3/4 inch thickness.
 - 2. Underlayment: APA UNDERLAYMENT INT, sanded, with exterior glue or APA UNDERLAYMENT CC PLUGGED EXT, square edge, sanded face where covered with resilient flooring, 1/4 inch or 1/2 inch thickness as indicated.
 - 3. Exposed interior use: Provide APA-AB-INT plywood with A grade exposed.

- C. Composite Headers: Lumber manufactured by laminating visually graded wood veneers, whose thickness range from 0.15 to 0.25 inches in thickness and grain runs parallel to long axis, to narrow faces of oriented strand board to produce rectangular members with veneers making up not less than 32 percent of total cross section.
1. Wood Species: Yellow-poplar, sweetgum, red maple, and southern pine, with a minor amount of elm, ash, sycamore, and black gum not to exceed 15 percent for finished product.
 2. Adhesives: Melamine formaldehyde adhesive for gluing veneers to each other and phenol formaldehyde adhesive for gluing veneers to oriented flakeboard.
 3. Sizes: Depth and width as indicated.
 4. Manufacturer/Product: "Micro=Lam" LVL Headers as manufactured by Trus Joist Corporation, Boise, Idaho, or an approved equal. Tel. (800) 628-3997.

2.02 ACCESSORY MATERIALS

- A. Rough hardware:
1. Provide bolts, plates, anchors, hangers and other miscellaneous steel and iron shapes as required for framing and supporting woodwork and for anchoring or securing woodwork to concrete or wood structures.
 2. Provide manufactured or fabricated items of sizes, shapes and dimensions required. Panel Clips: Provide clips sized for roof sheathing thickness.
 3. Bolts: ASTM A307. Provide with double washers. Furnish sill plate anchor bolts for installation under Section 03300 work.
 4. Steel: ASTM A36.
 5. Fasteners and anchorages: Provide size, type, material and finish required for nails, screws, bolts, nuts, washers and anchoring devices. Provide hot-dip galvanized finish for exterior locations, high humidity locations and treated wood; plain finish for other interior locations; size and type to suit application.
- B. Metal Framing Anchors: Galvanized steel framing anchors of structural capacity, type, size that comply with requirements specified.
1. Research or Evaluation Reports: Provide products for which model code research or evaluation reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal roofing anchors for application indicated
 2. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.
 3. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G60 coating designation, structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.
 4. Manufacturer: Simpson Strong-Tie Co., Inc., San Leandro, CA or approved equal. Tel. (800) 999-5099.
- C. Sill sealer: 1 inch thick by width required fiberglass blanket sill sealer.

2.03 PRESERVATIVE WOOD TREATMENT

- A. Hickson Corporation, "Wolmanized" or an approved equal pressure preservative treatment.
- B. Pressure treat all wood and plywood subject to termite infestation or in contact with concrete with water-borne preservatives. Each piece shall bear American Wood Preservers Bureau AWPB quality mark designation LP-2. Treat the following:
 - 1. Treat wood nailers, blocking, stripping and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
 - 2. Treat wood sills, blocking, furring, stripping and similar concealed members in contact with concrete.
 - 3. Treat fence posts and rails.
 - 4. Treat other wood members as noted or scheduled.
- C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment.
- D. Kiln-dry all materials after treatment to maximum 19% moisture content.

PART 3 – EXECUTION

3.01 INSTALLATION: GENERAL

- A. Set carpentry work accurately to required lines and levels with members plumb, true and accurately aligned, cut and fit. Work shall be performed in conformance with good trade practice, recommendations of manufacturers, building codes and these specifications.
- B. Securely attach carpentry work to substrate by anchoring and fastening as required to support applied loading, in accordance with recognized standards.
 - 1. Provide washers under bolt heads and nuts.
 - 2. Use fasteners of proper size that will not penetrate members where opposite side will be exposed to view or receive finish materials.
 - 3. Do not drive threaded friction type fasteners.
 - 4. Tighten bolts and lag screws at installation and retighten as required.
 - 5. Nails, screws and bolts used in connection with preservative treated wood shall be galvanized.
- C. Provide treated wood grounds, nailers, blocking, sleepers and furring where required for screeding or attachment of other work and surface applied items. Attach to substrate as required to support applied loading.
 - 1. Material: Framing lumber.
 - 2. Nominal Size: Match adjacent framing lumber, unless otherwise shown on drawings.
 - 3. Extent of Work: Provide blocking behind wall-supported loads, including cabinets, wardrobe rods, shelving, siding, roofing, sheet metal flashing and trim, doors, windows, finish hardware including door stops, railings, toilet room accessories, mirrors, miscellaneous specialties, building equipment, window traverse rods and shades, and mechanical and electrical work; verify exact locations.

3.02 FRAMING, PLATES, NAILERS, BLOCKING, FURRING AND GROUNDS

- A. Provide framing members of sizes and on spacings shown and frame openings to comply with NFPA "Manual for House Framing" recommendations. Cut, join and tightly fit framing around other work. Do not splice structural members between supports.
- B. Use only sound thoroughly seasoned materials of longest practical lengths and sizes to minimize joints. Use materials free of warp, unless warp can be easily corrected by anchorage and attachment. Make tight connections between members. Discard units with defects which might impair quality of work and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- C. Anchor and nail framing to comply with "Recommended Nailing Schedule" of the "Manual for House Framing" and other recommendations of NFPA.
- D. Provide treated sill plates where wood framing is supported by concrete construction. Install exterior wall sill plates over single layer of sill sealer. Anchor to embedded bolts.
- E. Provide fire stops and fire separations in wall and roof areas as required by applicable code requirements.
- F. Set studs at spacing shown on drawings. Unless noted otherwise, space interior 2 inch x 4 inch wood studs at 16 inch o.c. with nominal 4 inch face placed perpendicular to direction of wall or partition; where shown provide 2 inch x 6 inch exterior wall wood studs spaced 16 inch o.c. with nominal 6 inch face placed perpendicular to direction of wall or partition. Provide single bottom plate; double top plates, 2 inch thick by width of studs. Double studs at sides of all framed openings. Arrange three studs to provide bearing for nailing at all corners.
- G. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to that of studs. Set headers on edge and support on jamb studs.
- H. Provide treated sill plates where wood framing is supported by concrete construction. Install exterior wall sill plates over single layer of sill sealer placed directly on concrete foundation. Anchor to embedded bolts. Puncture gasket and fit tight to protruding foundation anchor bolts.
- I. Erect wood framing members level and plumb. Place horizontal members laid flat, crown side-up. Construct framing members full length without splices.
- J. Bolting of wood or structural members to concrete shall be, in general, with a minimum of 1/2 inch bolts at 4 feet 0 inch o.c. except where shown otherwise. Situations requiring special bolting shall be with the size and spacing of bolts to suit the conditions.
- K. Install wood plates, blocking, furring and nailing grounds as indicated and required. Coordinate work of other trades.
- L. All work shall be well fitted and securely fastened in its proper location with nails, screws, or other approved fastening devices.

3.03 SHEATHING AND BACKING PANELS

- A. Install plywood sheathing where indicated. Comply with recommendations of the American Plywood Association "APA Design/Construction Guide – Residential and Commercial, Form E30P/Revised April 96" for types of plywood products and applications indicated.
 - 1. Install with face grain across supports, using panels continuous over two or more spans with end joints between panels staggered and located over center of supports.
 - 2. At a minimum, fasten sheathing 6 inches on supported panels edges and 12 inches on center at intermediate supports for spans less than 48 inches, using 8d common nails.
 - 3. Allow 1/8 inch open space between end joints and edge joints (or space as provided by panel clips) for expansion and contraction of panels.
 - 4. Provide one roof sheathing panel-clip at each unsupported joint of panels between roof framing members, except provide 2 clips for spans over 48 inches.
- B. Install underlayment in accordance with APA Design/Construction Guide: "Residential and Commercial."
 - 1. Lay underlayment with face grain across supports, with end and end joints offset by at least 2 inches from joints of subfloor panels and not coinciding with framing below. allow 1/32 inch between panels.
 - 2. Fasteners flush with or slightly below surface.
 - 3. Fill and sand edge joints where used under resilient flooring; fill damaged or open areas elsewhere and sand surface roughness.

3.04 CLEANING

- A. Clean up debris and cutting on a regular periodic basis. Remove and dispose of excess materials and debris created by carpentry work.
- B. Maintain the buildings and site free of accumulations of cutting and waste materials in a neat orderly condition.

END OF SECTION 06100

SECTION 06200

FINISH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide finish carpentry as shown and specified. Work includes:
 - 1. Standing and running trim.
 - 2. Wood access panel.
 - 3. Closet and pantry wood shelving.
 - 4. Wood window stools.
 - 5. Wood privacy fencing materials.
- B. Related Sections:
 - 1. Section 02800 – Site Improvements: Wood fencing.
 - 2. Section 06100 – Rough Carpentry: Carpentry not exposed to view, wood treatment requirements.
 - 3. Section 08110 – Steel Clad Doors and Frames.
 - 4. Section 08210 – Wood Doors.
 - 5. Section 08710 – Door Hardware.
 - 6. Section 12370 – Residential Casework: Casework and countertops.

1.02 SUBMITTALS

- A. Submit samples of lumber and plywood, showing species, grade, profile and cut proposed for the work. Provide shop finished materials, finished on upper half of sample.
 - 1. Standing and running trim: 2'-0" in length x full width.

1.03 QUALITY ASSURANCE

- A. Installation: Performed only by experienced skilled finish carpenters.
- B. Provide lumber and plywood factory grade-marked on concealed surfaces. Omit marking and submit mill certificates for materials that cannot be marked on a concealed surface.
- C. Standards:
 - 1. Architectural Woodwork Institute (AWI):
 - a. AWI "Architectural Woodwork Quality Standards, 7th Edition, 1997."
 - b. AWI Section 100 "Lumber."
 - c. AWI Section 200 "Panel Products."
 - d. AWI Section 300 "Standing & Running Trim & Rails (Interior & Exterior)."

- e. AWI Section 600 "Closet and Utility Shelving."

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect finish carpentry and millwork materials during delivery, storage, and handling to prevent damage, soiling, and deterioration.
- B. Do not deliver finish carpentry and millwork materials until concrete and other similar wet work has been completed and is thoroughly dry, outside door openings are permanently watertight, exterior windows are glazed and, in case of temperature dropping below 60 degrees F., until temporary heating and ventilating systems are in operation.
- C. Store materials in dry well-ventilated spaces with constant minimum temperature of 60 degrees F. and maximum relative humidity of 55 percent.

1.05 PROJECT CONDITIONS

- A. Provide and maintain a constant temperature and humidity before, during and after installation as required to maintain optimum moisture content of installed materials.
- B. Obtain measurements and verify dimensions and details before proceeding with finish carpentry work.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Lumber, particleboard and plywood materials: Comply with AWI Quality Standards, Custom Grade.
 - 1. Section 100: Lumber.
 - 2. Section 200: Panel Products.
- B. Provide lumber surfaced four sides (S4S) and worked to profiles and patterns shown. Nominal sizes are as shown, except where detailed dimensions are indicated.
- C. Moisture Content: Provide materials kiln-dried to moisture content complying with AWI Standards, Section 100-S-3.
- D. Softwood lumber: Comply with DOC PS 20-94 "American Softwood and Lumber Standard" and with applicable grading rules of grading and inspection agency for species indicated.
 - 1. Southern Pine: Standard Grading Rules for Southern Pine Lumber, 1994 published by Southern Pine Inspection Bureau (SPIB).
 - 2. Douglas Fir, Western Red Cedar, Ponderosa Pine, White Pine: Western Lumber Grading Rules 1991 with May 1993 Supplement (No. 3), published by Western Wood Products Association (WWPA), or Standard No. 17-1991: Grading Rules for West Coast Lumber, published by West Coast Lumber Inspection Bureau (WCLIB).

- E. Softwood plywood: Comply with PS 1-83 "U.S. Product Standard for Construction and Industrial Plywood," published by U.S. Department of Commerce.
- F. Particleboard: Comply with ANSI A208.1-93 "Particleboard."
- G. Fasteners: Provide type, size, material and finish as required by conditions of use, substrate material and adequate anchorage for the work.
 - 1. Exterior fasteners: Provide non-corrosive hot-dipped galvanized or aluminum alloy fasteners of sufficient length and withdrawal resistance to properly secure materials. Provide screws and sinker head siding type nails at wood trim.

2.02 EXTERIOR MATERIALS

- A. Lumber Species and Finish:
 - 1. Wood Fencing Materials: S4S No. 2 or Btr. construction grade Western Red Cedar, board width as indicated.
 - a. Finish: Painted finish in color(s) as scheduled or noted on drawings.

2.03 INTERIOR MATERIALS

- A. Hardwood trim: Provide finished lumber and moldings complying with the following standards including those of the grading agency listed with species:
 - 1. Grading Agency/Species: Western Wood Molding and Millwork Producers Association (WMMPA) WM/ Series Wood Molding Patterns, "P" Grade Poplar for opaque painted finish.
 - 2. Texture: Surfaced (Smooth).
 - 3. Lumber for opaque finish: Solid or finger-jointed lumber stock.
 - 4. Wood molding patterns: Provide stock moldings made to patterns included in WMMPA WM 7 and graded under WMMPA WM 4.
 - a. Base Molding: GPM-503 5/8 inch x 3-1/4 inch.
 - b. Casing: GPM-310 3/4 inch x 2-3/4 inch.
- B. Wood Shelving: Provide the following:
 - 1. Clothes Closet Shelving: 3/4-inch thick plywood shelving with 1/2 inch lumber edge band with eased edges. Painted finish on all surfaces.
 - a. Shelf Cleats: 3/4-by-3-1/2-inch boards of same species and grade indicated above for interior softwood trim.
 - b. Shelf and Closet Pole Support: Stanley #19-2999.
 - c. Closet Rod: Stanley #V7052.
 - 2. Utility and Other Shelving: 3/4-inch plywood shelving with 3/4 inch by 1-1/2 inch solid lumber dropped edge. Painted finish all surfaces.

- a. Shelf Cleats: 3/4-by-3-1/2-inch boards of same species and grade indicated above for interior softwood trim.
- C. Plywood Hatch: Provide hatch as indicated on the drawings and as follows:
 - 1. Material: 1/2 inch thick APA-AB-INT softwood veneer plywood with hardwood edge bands on all exposed edges for drop in application, painted finish.
 - 2. Hatch support: GPM-310 molding, painted finish to match ceiling.
- D. Wood Stairs:
 - 1. Treads: 1-1/16 inch clear, kiln-dried, edge-glued stepping with half-round nosing.
 - a. Species: Poplar.
 - 2. Risers and Skirt Board: 3/4 inch finish boards as specified for interior softwood trim.
 - 3. Wood molding pattern: Provide stock molding made to patterns included in WMMPA WM 7 and graded under WMMPA WM 4.
 - a. Handrail: WM 240.
 - b. Species: Poplar for stained, transparent finish.
 - 4. Handrail Bracket: Stanley DP57-1050, with US3 finish.

2.04 FABRICATION

- A. Field verify dimensions and installation conditions affecting the work.
- B. Fabricate finished work properly framed, closely fit and accurately set to required lines and levels and rigidly secured in place.
- C. Fabricate work straight, plumb, level and in true alignment; neatly and accurately fit, scribed and thoroughly secured. Miters and other joints shall be planed and sanded. All work shall be left clean and free from warp, twist, open joints and other defects.
- D. Provide finished woodwork dressed and sanded free from machine and tool marks, abrasions, raised grain or other defects on surfaces exposed to view in finished work. Exposed wood surfaces shall be uniform in color and grain.

2.05 WOOD TREATMENT

- A. Provide wood materials indicated to be preservative treated, pressure preservative treated with water-borne preservatives in accordance with Section 06100 – Rough Carpentry wood treatment requirements.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Condition finish carpentry and millwork materials and products for not less than 48 hours to average prevailing humidity conditions in installation areas before installing.
- B. Coordinate installation of blocking and anchoring devices built into substrates under Section 06100 – Rough Carpentry work for anchorage of finish carpentry and millwork items.

3.02 INSTALLATION

- A. Install finish carpentry and millwork materials and products plumb, level, true and straight with no distortion. Shim as required using concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level and with 1/16 inch maximum offset in flush adjoining surfaces, 1/8 inch maximum offsets in revealed adjoining surfaces.
- B. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- C. Install standing and running trim with minimum number of joints. Use full length pieces, from maximum length of lumber available, to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners and comply with Quality Standards for joinery. Butt joints, except as detailed, are not acceptable.
- D. Anchor finish carpentry and millwork items to built-in place blocking or directly attach to substrate framing. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Use finish nails for exposed nailings, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated. Plug and sand screw fastener holes.
- E. Assemble wood shelving and install in areas indicated, including hardware and accessories as required.
 - 1. Provide coat rods supports and trim.
 - 2. Sand exposed surfaces smooth and leave ready to receive site applied finishes.
- F. Case all door and window openings and all other openings scheduled. Cased window openings to match door openings.

END OF SECTION 06200

This page was intentionally left blank for duplex printing.

SECTION 07210
BUILDING INSULATION

PART 1 – GENERAL

1.01 SUMMARY

A. Provide building insulation as shown and specified. Work includes:

1. Batt and blanket thermal insulation.
2. Sound attenuation insulation.
3. Insulation accessory materials.
4. Loose-fill building insulation in attic spaces.

B. Related Sections:

1. Section 06100 – Rough Carpentry.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of insulation required.
- B. Submit manufacturer's certification that materials supplied for project use comply with specified requirements.

1.03 QUALITY ASSURANCE

- A. Insulation thermal properties: Thermal Conductivity K-factors and Thermal Resistance R-values indicated are values at 75°F. mean temperature. Where insulation is identified by R-value, provide thickness required to achieve indicated R-value. Foam plastic insulation R-values are "aged" thermal values in accordance with RIC/TIMA conditioning procedures.
- B. Thermal and sound attenuation insulation: Insulation and facing materials shall meet following classification requirements when tested in accordance with ASTM E84. Insulation materials shall be classified non-combustible when tested in accordance with ASTM E136.
1. Plenums: Flame spread rating of 25 or less; smoke developed rating of 50 or less.
 2. Exposed and concealed installation: Flame spread rating of 25 or less; smoke developed rating of 450 or less.
- C. Foam plastic insulation: Foam plastic insulation cores, coatings and facings shall meet flame spread rating of 25 or less; smoke developed rating of 450 or less when tested in accordance with ASTM E84.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver insulation materials in manufacturer's original, unopened, and labeled packages.
- B. Store insulation materials at the site in a dry, ventilated place. Exterior storage not permitted. Comply with manufacturer's recommendations for handling and protection during installation.
- C. Remove fibrous batt and blanket insulation that has become wet before or after installation. Replace with new, dry insulation.

PART 2 – PRODUCTS

2.01 INSULATION MATERIALS

- A. Faced Glass Fiber Batt/Blanket Insulation: Glass fibers and binders formed into flexible batts or blankets complying with ASTM C665 for Type II, Class C (blankets manufactured with a kraft paper facing on one side providing a vapor barrier with a perm rating of 1.0 or less); manufacturers standard lengths and widths required to interface with size of space insulated.
 - 1. 2 by 4 Exterior Walls: R = 11 (minimum), nominal 3-1/2 inch thick.
 - 2. 2 by 6 Exterior Walls: R = 19 (minimum), nominal 5-1/2 inch thick.
 - 3. Ceilings: R = 38, nominal 15 .50 inches thick.
 - 4. Standards: Owens-Corning "Thermal Batts," Schuller International Inc., Building Insulation Division "Thermal-Shield" or Certainteed "Building Insulation".
 - 5. Install batt insulation in all spaces between wood framing and new exterior door frames.
- B. Sound Attenuation Insulation: Glass or other inorganic fibers and resinous binders formed into flexible batts or blankets, complying with ASTM C665, Type I unfaced, manufacturer's standard sizes, thickness as indicated; lengths and widths required to interface with size of space insulated.
 - 1. Interior Partitions: Unfaced, R = 11, nominal 3-1/2 inches thick.
 - 2. Standards: Owens-Corning "Fiberglas Noise Barrier Batts," Schuller International Inc., Building Insulation Division Sound-Shield "Sound Control Batts," or Certainteed "Sound Control Batts".
- C. Glass-Fiber Loose-Fill Insulation: Glass fibers processed to comply with ASTM C 764 for type (method of application) indicated below; maximum flame-spread and smoke-developed indices of 5 and 5 respectively, and as follows:
 - 1. Type 1 for pneumatic application in an open blow.
 - 2. Thickness: R-38 r value.

2.02 ACCESSORY MATERIALS

- A. Mechanical fasteners: Non-corrosive galvanized steel nails for wood framing.

- B. Vapor Barrier Tape: Pressure sensitive polyester, polyethylene or aluminum foil, minimum 3 inch width; type recommended by the insulation manufacturer for the application. Provide UL Class A listed tape for use with Class A foil-kraft vapor barriers.
 - 1. Acceptable manufacturers/products:
 - a. Alumiseal Corp., "Alumiseal Zero Perm".
 - b. Fortifiber Corp., "Fortifiber".
 - c. Griffolyn Co., "Griff-Tape T350".
- C. Vapor Barrier: ASTM D4397, 6 mils thick, polyethylene sheet with maximum permeance rating of 0.13 perm.
- D. Insulation Baffle: Extruded polystyrene rafter vent, manufacturer's recommended mechanical fasteners and spacing of fasteners to rafters, length and width to suit rafter spacing.
 - 1. Acceptable manufacturers/products:
 - a. Standard: Owens-Corning, "Raft-R-Mate," or an approved equal.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify substrate surfaces are dry and free of irregularities or substances harmful to insulation. Remove projections which interfere with insulation placement.
- B. Verify mechanical and electrical services within walls have been installed, tested and inspected.

3.02 INSTALLATION – VAPOR BARRIERS

- A. Extend vapor barrier to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor barrier to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber-type insulation.
- B. Seal overlapping joints in vapor barriers with mechanical fasteners or adhesives per vapor barriers manufacturer's printed directions. Seal butt joints and fastener penetrations with type of tape recommended by vapor barrier manufacturer. Locate all joints over framing members of other solid substrates with mechanical fasteners or adhesives as recommended by the manufacturer.
- C. Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor barriers with cloth or aluminized tape of type recommended by vapor barrier manufacturer to create an air-tight seal between penetrating objects and vapor barrier.
- D. Repair tears or punctures in vapor barriers immediately before concealment by other work. Cover with tape or another layer of vapor barrier.

3.03 INSTALLATION: GENERAL

- A. Install insulation in accordance with manufacturer's recommendations for conditions of installation indicated. When not applicable, consult with manufacturer's technical representative for specific recommendations before proceeding with the work.
- B. Extend insulation full thickness over entire area to be insulated. Cut and fit tightly around obstructions. Fill all voids.
- C. Install insulation in single layer of required thickness. Do not install torn blanket insulation.
- D. Provide insulation continuous behind electrical boxes, conduit, piping and ductwork.
- E. Place loose-fill insulation into spaces and onto surfaces by machine blowing to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.
 - 1. For cellulosic loose-fill insulation, comply with the Cellulose Insulation Manufacturers Association's Special Report #3, "Standard Practice for Installing Cellulose Insulation."

3.04 INSTALLATION: FIBROUS BATT AND BLANKET INSULATION

- A. Install batt and blanket type insulation with tight fitting butt joints. Provide supplementary support at vertical and horizontal installations when required to maintain insulation in permanent proper location.
 - 1. Provide cardboard or plastic baffle insulation stops at roof/ceiling eaves and low sections to ensure free flow ventilating of the roof cavity. Do not permit obstruction of ventilation openings. Extend baffles above insulation in attic spaces.
 - 2. Secure insulation with mechanical fasteners through flanges. Maintain ventilation spaces indicated.
 - 3. Install faced units with vapor barrier exposed to the interior. Install vapor barriers to provide continuous vapor protection.
- B. Fill miscellaneous voids and spaces in wall framing and at window and door framing with batt insulation stuffed in place.
- C. Fit insulation tight to side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids. Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor barriers with cloth or aluminized tape of type recommended by vapor barrier manufacturer to create an air-tight seal between penetrating objects and vapor barrier.
- D. Repair tears or punctures in vapor barriers immediately before concealment by other work. Cover with tape or another layer of vapor barrier.

3.05 INSTALLATION – SOUND INSULATION

- A. Install interior wall sound insulation at unit demising walls as indicated.
 - 1. Install insulation tight between framing members. Cut and fit tightly around all obstructions and fill all voids.

3.06 PROTECTION

- A. Protect installed insulation from harmful weather exposures and from possible physical abuses, where possible non-delayed installation of concealing work, or where that is not possible, by temporary covering or enclosure.
- B. Seal all cuts, punctures and penetration of integral insulation vapor barriers with vapor barrier tape before installing surface finishes.

END OF SECTION 07210

This page was intentionally left blank for duplex printing.

SECTION 07311
ASPHALT SHINGLES

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide asphalt shingle roofing and roofing accessories as shown and specified including the following:
 - 1. Patching Selective Demolition Roof Penetrations: Provide dimensional roof shingles that match existing shingles in weight, profile, composition and granular color.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry.
 - 2. Section 07600 – Flashing and Sheet Metal.
 - 3. Division 15 – Mechanical: Mechanical items penetrating roof surface.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions.
- B. Submit certification of shingle applicator's qualifications.
- C. Submit manufacturer's samples of shingles.

1.03 QUALITY ASSURANCE

- A. Application: Performed by an experienced asphalt shingle installer with a satisfactory record of performance on projects of comparable size and quality.
- B. Provide labeled materials that have been tested and listed by Underwriters' Laboratories, Inc. (UL) for Class and Rating indicated.
- C. Standards:
 - 1. Asphalt Roofing Manufacturers Association (ARMA):
 - a. ARMA "Residential Asphalt Roof Manual."
 - 2. National Roofing Contractors Association (NRCA):
 - a. NRCA "Steep Roofing Manual."

3. Sheet Metal and Air Conditioning Contractor's National Association, Inc. (SMACNA):
 - a. SMACNA "Architectural Sheet Metal Manual."

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's unopened, labeled containers, or bundles.
- B. Store materials to prevent soiling and damage. Store rolled materials on ends. Comply with material manufacturer's recommendations for job site storage and protection.

1.05 PROJECT CONDITIONS

- A. Coordinate installation of shingle work with flashing and other adjoining work to ensure proper installation sequencing.
- B. Do not install shingle roofing until completion of substrate construction and vents, stacks and other penetrations through the roof have been installed.

1.06 WARRANTY

- A. Submit a written warranty, executed by the manufacturer, agreeing to repair or replace asphalt shingles that fail in materials or workmanship within the specified warranty period. Failures include but are not limited to, deformation or deterioration of shingles beyond normal weathering. This warranty shall be in addition to, and not a limitation of other rights the Government may have against the Contractor under the Contract Documents.
 1. Submit manufacturer's 25 year shingle material warranty and five protection plan.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Patching Selective Demolition Roof Penetrations: Provide dimensional roof shingles that match existing shingles in weight, profile, composition and granular color.
 1. UL Class "C," fire-resistance, mineral granule surfaced, interlocking, minimum 250 lb. per square, asphalt-saturated organic felt composition shingles complying with ASTM D3161, Type 2, for U.L. wind-resistance, ASTM E108, Class "C" external fire exposure label.
- B. Shingle Underlayment: ASTM D226 No. 15 (Type I) unperforated asphalt roofing felt provided in two layers thickness over roof surface.
- C. Nails: Aluminum or hot-dip galvanized 11 or 12 gage sharp pointed conventional roofing nails with barbed shanks, minimum 3/8 inch diameter head and of sufficient length to penetrate through plywood sheathing and in accordance with shingle manufacturers specifications.

- D. Roofing cement: ASTM D4586, Type II asphalt plastic cement.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify substrate is clean, dry and free of projections or voids detrimental to shingle work. Cover voids in substrate with sheet metal flashing secured with roofing nails.
- B. Install roof flashing and sheet metal work furnished under Section 07600 – Flashing and Sheet Metal, and built into asphalt shingle work. Weatherlap and seal all joints.

3.02 INSTALLATION

- A. Install asphalt shingles in accordance with manufacturer's installation instructions except as prescribed herein, and to comply with ARMA "Residential Asphalt Roofing Manual" recommendations and drawing details. Coordinate with installation of roof deck and other substrate to receive accessory units and flashings as required, to ensure that each element of the work perform properly and that combined elements are waterproof and weathertight. Anchor shingles securely to supporting structural substrates with manufacturer's recommended nailing plus fifty percent per standard shingle, with equivalent nailing and spacing on hip and ridge shingles, adequate to withstand lateral and thermal stresses, as well as inward and outward loading pressures.
- B. Install sheet metal drip edges at eaves and rakes. Install eave drip edges directly to substrate surface and rake drip edges over the shingle underlayment.
- C. Install step flashing at vertical side walls, flashing at vertical front walls, vent pipe flashing, chimney flashing and dormer flashing as shingle work progresses. Comply with SMACNA recommendations and drawing details.
- D. Set and make weathertight roof stack and vent flashing furnished under Division 15 mechanical work.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 07465

EXTERIOR SOFFIT AND TRIM

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide soffit materials as shown and specified. Work includes:
 - 1. Retain existing steel fascia and trim.
 - 2. Replace damaged existing steel fascia and trim.
 - 3. Vinyl soffits and trim.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions.
- B. Submit 12 inch lengths of full size soffit and trim samples in selected color.

1.03 QUALITY ASSURANCE

- A. Application: Performed by an experienced vinyl siding installer with satisfactory record of performance on completed projects of comparable size and quality.
- B. Obtain each color, grade, finish, type, and variety of siding and related accessories from a single source.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store materials to prevent soiling and damage. Comply with material manufacturer's recommendations for job site storage and protection.

1.05 PROJECT CONDITIONS

- A. Install when existing and forecasted weather conditions permit; in compliance with manufacturer's recommendations and when substrate is completely dry.

1.06 WARRANTY

- A. Submit a written warranty, executed by the manufacturer, agreeing to repair or replace soffit that fails in materials or workmanship within the specified warranty period. Failures include but are not limited to, deformation or deterioration of soffit beyond normal weathering. This warranty shall be in addition to, and not a limitation of other rights the Government may have against the Contractor under the Contract Documents.

1. Submit manufacturer's 20 year warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturer: Specifications are based on products of Alcoa Building Products, Div. Stolle Corp., Inc. Subject to compliance with requirements, other manufacturers offering soffit and trim may be incorporated in the work.

2.02 MATERIALS AND COMPONENTS

- A. Vinyl Soffit: Standard: Alcoa "Pro-Select" soffit.
 1. Formed Vinyl Soffit: Perforated and non-perforated soffit panels and accessories fabricated from a polyvinyl chloride compound complying with ASTM D3679-93 and ASTM D4477-94, Class 2, and meeting manufacturer's published physical properties.
 2. Design: "PSS10V" (vented); air flow 7.53 inches per sq. ft., "PSS10N" (non-vented); smooth finish, 0.046 inch average thickness, fabricated in 12'-0" lengths, factory notched to form overlapping panel joints.
 3. Exposure: 5 inch exposure in 10-inch nominal width.
 4. Accessories: Provide cellular vinyl channel framing, trim and other items as indicated or as recommended by manufacturer for building configuration.
 5. Fasteners: Manufacturer's standard corrosion resistant type, size and length required to secure and rigidly retain soffit and accessory components in place.
 6. Color: Colors as scheduled or noted on drawings.
- B. Accessory Materials:
 1. Fascia: Galvanized steel with PVC finish as standard with siding manufacturer compatible color, finish, texture as steel siding material, formed to completely wrap over wood fascia boards. Color as scheduled or noted on drawings.
 2. Nails: Aluminum nails with minimum tensile strength of 63,000 psi. Provide minimum 1/4 inch penetration into solid substrate, type suitable for material being anchored and substrate material.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of soffit materials. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Coordinate installation with other adjoining construction to ensure proper sequencing.

3.03 INSTALLATION

- A. Soffit: Comply with soffit manufacturer's installation instructions and recommendations. Center nails in elongated nailing slots without binding soffits to allow for thermal movement. Install trim and accessories in accordance with manufacturer's recommendations.
- B. Fascia Trim: Install fascia trim over wood fascias in accordance with manufacturer's installation instructions. Securely fasten in place using concealed fasteners and anchorage. Provide joints arranged for best visual appearance and acceptable to the Contracting Officer.
- C. Provide all trim and accessories required for complete installation. On-site fabrication of component profiles and accessories is not acceptable.
 - 1. Fit neatly at joints and against trim.
 - 2. Accurately scribe to adjacent surface irregularities.
 - 3. Fit accurately and neatly around projections through fascia materials.

3.04 ADJUSTING

- A. Replace damaged materials with new materials complying with specified requirements.

3.05 CLEANING

- A. Cleaned finished surfaces as recommended by siding manufacturer, and maintain in a clean condition during construction.

END OF SECTION 07465

This page was intentionally left blank for duplex printing.

SECTION 07600

FLASHING AND SHEET METAL

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide flashing and sheet metal work as shown and specified. Work includes:
 - 1. Flashing and sheet metal items as indicated.
 - 2. Relocation of existing downspouts as indicated on the drawings and patching existing gutters.
- B. Related Sections:
 - 1. Section 07311 – Asphalt Shingles: Materials and installation.
 - 2. Section 07465 – Exterior Soffit: Vinyl soffit and related materials.
 - 3. Section 07900 – Joint Sealers: Sealants not specified in this section.
 - 4. Section 09900 – Painting: Painting sheet metal.
 - 5. Division 15 – Plumbing and mechanical items with roof penetration flashings.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for factory fabricated and prefinished products.
- B. Submit 8 inch square material samples with applied coating in selected color for factory fabricated and prefinished items.

1.03 QUALITY ASSURANCE

- A. Comply with Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) "Architectural Sheet Metal Manual" recommendations for fabrication and installation of the work.

1.04 WARRANTY

- A. Contractor's warranty required for roofing system work shall include all roof flashing and sheet metal work.
- B. Submit manufacturer's finish coating warranty for prefinished sheet metal.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Aluminum Sheet: ASTM B209 alloy 3003-H14, or temper as required for forming and performance, thickness indicated, or if not indicated, not less than 0.040 inch; of the following general descriptions:
 - 1. Wall flashings: Includes window and door head flashing; form of minimum 0.025 inch aluminum.
 - 2. Roof and shingle flashings: Includes pieced shingle flashings at roof rakes, horizontal strip flashing on roofs; form of minimum 0.025 inch aluminum.
 - 3. Color: Match color of overlaying material.
- B. Fasteners: Provide same metal as sheet metal or other non-corrosive compatible metal recommended by sheet metal manufacturer. Match finish of exposed heads with materials being fastened.
- C. Bituminous coating: Solvent type bituminous mastic.
- D. Joint sealers: One-component silicone or polyurethane elastomeric joint sealant. Color matched to factory finished materials at prefinished sheet metal systems.
- E. Metal accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material installed, non-corrosive, size and thickness as required for performance.
 - 1. Roof apron/drip edge: Alcoa RT-3 type, 0.027 inch gauge, color to match shingles.
- F. Underlayment: ASTM D226, No. 30 (Type II) unperforated asphalt roofing felt.
- G. Slip sheet: FS UU-B-790, Type 1, Style 1b, rosin-sized building paper, 5 lb. per square, single ply.
- H. Roofing cement: ASTM D4586, Type 1, asbestos-free, asphalt-based cement.
- I. Splash Blocks: Retain existing precast concrete, nominal 12 inch wide by 36 inches long by 4 inches thick, with smooth finish countersunk dishes positioned to drain away from the building. Retain blocks at outlets of existing downspouts emptying at grade or relocate existing splashblocks to relocated downspouts locations.

2.02 FABRICATION

- A. Form sections square, true and accurate to size and profile, free from distortion and other defects detrimental to appearance or performance. Fabricate work in continuous lengths without seams, to sizes indicated.
- B. Fabricate for watertight and weatherproof performance with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form exposed sheet metal work with exposed edges folded back to form hems.

- C. Fabricate non-moving seams in sheet metal with flat seams. Form seams and seal with epoxy seam sealer. Rivet joint for additional strength.
- D. Seal movable non-expansion type joints with joint sealant. Form joints as indicated, when not indicated, in compliance with industry standards to receive joint sealants.
- E. Provide for separation of metal from non-compatible or corrosive substrates by coating concealed surfaces with bituminous coating or other permanent separation as recommended by the sheet metal manufacturer.
- F. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not permitted on faces of sheet metal exposed to public view.
- G. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, non-corrosive metal recommended by sheet metal manufacturer.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Coordinate flashing and sheet metal work with other work for the correct sequencing of items which make up the entire membrane or system of weatherproofing and rain drainage.

3.02 INSTALLATION

- A. Comply with SMACNA "Architectural Sheet Metal Manual" recommendations, drawing details and accepted shop drawings for installation of the work.
- B. Install prefabricated sheet metal items in accordance with manufacturer's installation instructions.
- C. Anchor units securely in place by methods indicated, providing for thermal expansion. Conceal fasteners and expansion provisions whenever possible. Install joint sealants where required.
- D. Set units true to lines and levels indicated. Install work with sealed laps, joints and seams which will be permanently watertight and weatherproof. Bed flanges of work in thick coat of roofing cement or sealant compatible with roofing membrane.
- E. Separate sheet metal work from dissimilar metals, treated wood and cementitious materials. Provide roofing felt underlayment and rosin-sized paper slip sheet over treated wood surfaces.

3.03 CLEANING

- A. Clean exposed prefinished metal surfaces. Remove substances which may cause corrosion of metal and deterioration of finishes. Touch-up exposed edges and damaged coated surfaces with manufacturer's color matched touch-up paint.

- B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim work is without damage or deterioration at time of project completion.

END OF SECTION 07600

SECTION 07900

JOINT SEALERS

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide joint sealers as shown and specified. Work includes exterior and interior joint sealants including:
 - 1. Exterior and interior elastomeric joint sealants. Work shall include recaulking of all existing windows, all existing exterior doors and and new exterior doors.
 - 2. Interior acrylic joint sealants.
 - 3. Interior silicone joint sealants.
 - 4. Joint backing materials and accessories.
 - 5. Substrate cleaners, primers, and sealers.
- B. Related Sections:
 - 1. Section 07600 – Flashing and Sheet Metal: Sealing sheet metal joints.
 - 2. Section 09260 – Gypsum Board Systems: Sound/fire control caulking at gypsum board systems.
 - 3. Division 15 and 16 sections.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of joint sealer and accessory material required.
- B. Submit certified performance test data sheets for fire-resistant penetration sealants required.

1.03 QUALITY ASSURANCE

- A. Provide each type of joint sealer required produced by one manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged, and labeled containers.
- B. Store, handle and protect materials from damage or contamination from foreign materials in accordance with manufacturer's recommendations.

1.05 PROJECT CONDITIONS

- A. Apply joint sealants as late as possible in the construction, preceding application of painting and following cleaning operations. Do not apply joint sealants during inclement weather conditions or when temperature is above or below manufacturer's limitations for installation.

1.06 WARRANTY

- A. Contractor and joint sealant applicator shall jointly warranty elastomeric joint sealants work for two years from date of final acceptance. Warranty shall include replacing joints which fail to perform as airtight; or fail in adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration and stain resistance or general durability.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufactures: Subject to compliance with requirements, products which may be incorporated in the work include products of the following manufacturers or an approved equal:
 - 1. Tremco Inc., Cleveland, OH
 - 2. Sonneborn Building Products, Minneapolis, MN
 - 3. Dow Corning Corporation, Midland, MI
 - 4. Mameco International, Cleveland, OH
 - 5. Pecora Corp., Harleysville, PA
 - 6. U.S. Gypsum Co., Chicago, IL.

2.02 MATERIALS

- A. General:
 - 1. Compatibility: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Colors: Matching or compatible with materials being sealed as selected by Contracting Officer from manufacturer's standard color range.
- B. Silicone Sealant: Provide high performance silicone sealants for joints in the building where indicated on the drawings or scheduled.
 - 1. Low Modulus: One component, non-sag, complying with requirements of ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A, and O.
 - a. Manufacturer/Product Standard: Dow Corning Corp. #790; Tremco Spectrum 1.

2. Medium Modules: One Component, non-sag, complying with requirements of ASTM C920, Type S, Grade NS, Class 25, Use NT, M, G, A, and O.
 - a. Manufacturer/Product Standard: Dow Corning Corp. #795; G.E. Silpruf, Tremco Spectrum 2.
- C. Polyurethane Sealant: Provide polyurethane sealants for joints in construction where indicated on the drawings or scheduled.
 1. Two-part Self-leveling Sealant: Comply with the requirements of ASTM C920, Grade P, Class 25; Use T, M, A and O.
 - a. Manufacturer/Product Standard: Sonneborn SL2; Vulkem 245; Tremco THC900/901.
 2. Two-part Non-Sag Sealant: Comply with requirements of ASTM C920, Type M, Grade NS, Class 25, Use T, M, A, and O.
 - a. Manufacturer/Product Standard: Sonneborn NP 2; Vulkem 227; Tremco Dymeric 511.
 3. One-part Self-leveling Sealant: Comply with requirements of ASTM C920, Type M, Grade P, Class 25, Use T, M, A, and O.
 - a. Manufacturer/Product Standard: Sonneborn SL1; Vulkem 45; Tremco Tremflex SL.
 4. One-part Non-Sag Sealant: Comply with requirements of ASTM C920, Grade NS, Class 25, Type S.
 - a. Manufacturer/Product Standard: Sonolastic NP1; Vulkem 921, Tremco Dymeric.
- D. Caulking: Provide caulking for joints in interior construction where indicated on the drawings or scheduled.
 1. One-Component Caulking: Acrylic-emulsion latex caulk; non-staining, non-bleeding, complying with the requirements of ASTM C834.
 - a. Manufacturer/Product Standard: Pecora AC-20, Tremco Acrylic Latex 834, Sonneborn Sonolac.
- E. Sanitary Sealant: Provide sanitary sealant at locations indicated on the drawings or scheduled.
 1. One-component mildew-resistant, non-sag silicone sealant complying with the requirements of ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - a. Manufacturer/Product Standard: Dow Corning Corp. #786, Sonneborn Omniplus, Tremco Tremsil 600.

- F. Acoustical Sealant: Provide acoustical sealant for joints in construction where indicated on the drawings, or scheduled.
 - 1. Sealant: Single component, water based caulking for sound rated partitions; non-bleeding and non-staining complying with the requirements of ASTM C919.
 - a. Manufacturer/Product Standard: USG Sheetrock Acoustical Sealant, Tremco Acoustical Sealant, Pecora BA-98.
- G. Fire-resistant Penetration Sealants: Provide through-penetration firestopping of fire-rated construction per systems or devices listed in the U.L. Fire Resistance Directory.
 - 1. Fire Barrier Caulk: Single component, water based caulking, to be used for non-combustible pipe penetrations (steel, conduit, black iron, etc.) through one-hour fire rated demising walls.
 - a. Manufacturer/Product Standard: 3M "Fire Barrier CP 25WB+ Caulk" or approved equal.
 - 2. Fire Barrier Wrap/Strip: One-part, organic/inorganic, fire resistive elastomeric sheet with aluminum foil on one side, to be used for combustible pipe penetrations (PVC, ABS) through one-hour fire rated demising walls.
 - a. Manufacturer/Product Standard: 3M "Fire Barrier FS-195+ Wrap/Strip" or approved equal.
- H. Foam air-infiltration sealant W. R. Grace Co. "Polycel One" or approved equal foam air-infiltration small joint seam sealer sealant.

2.03 ACCESSORY MATERIALS

- A. Joint primer/sealer: Non-staining type, recommended by sealant manufacturer for joint surfaces to be primed or sealed.
- B. Joint cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Bond breaker tape: Pressure sensitive polyethylene or plastic tape, recommended by sealant manufacturer, to suit applications where bond to substrate shall be avoided for proper joint sealant performance.
- D. Joint backing: Compressible rod stock of polyethylene foam, polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material recommended by sealant manufacturer for back-up of sealant; compatible with joint sealant, oversized 30 percent.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Clean, seal and prime surfaces in accordance with manufacturer's recommendations.
- B. Remove dust, dirt, loose coatings, moisture and other substances which could interfere with sealant bond.

3.02 INSTALLATION

- A. Install joint sealer materials and accessories in strict accordance with manufacturer's installation instructions.
- B. Install sealant backer rod, except where recommended to be omitted by sealant manufacturer for application indicated. Use rod diameter that will cause compression when installed.
- C. Apply sealer materials using hand guns or pressure equipment with proper nozzle size. Apply joint sealants in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces on both sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. At horizontal joints between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt. Hand tool and finish all joints.
- D. Install joint sealants within recommended temperature ranges and to depths indicated or when not indicated, as recommended by sealant manufacturer.
- E. Protect adjacent surfaces from damage. Clean soiled surfaces immediately. Replace damaged material which cannot be properly cleaned with new materials.
- F. Install fire-resistant penetration sealant systems at unit separation wall and floor penetrations by conduit and pipes to seal penetrations against passage of fire, smoke or other gases.

3.03 SCHEDULE

- A. Caulk exterior and interior joints around door frames and other openings in exterior walls with silicone sealant.
- B. Caulk expansion and isolation joints in concrete sidewalks, patios and interior slabs with self-leveling polyurethane sealant.
- C. Caulk non-movement general interior joints with acrylic latex caulk.
- D. Caulk perimeter of bathtubs, backsplashes of kitchen countertops with sanitary sealant.
- E. Caulk spaces around utility penetrations through unit separation walls with fire-rated sealant for non-combustible piping and sheet metal protective enclosure around wrap strip for combustible piping.

- F. Where subject to air infiltration, caulk spaces between wall framing members and window, doors, and other openings in exterior walls with foam air infiltration sealant. Air infiltration sealant is not to be used in lieu of fiberglass batt insulation for such applications
- G. Below grade wall penetrations with non-sag polyurethane sealant, compatible with waterproofing.
- H. Install sealants at other locations shown or required, with sealant appropriate for application, applied in accordance with sealant manufacturer's instructions.

END OF SECTION 07900

SECTION 08110

STEEL CLAD DOORS AND FRAMES

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide steel clad doors and frames as shown and specified. Work includes:
 - 1. Steel clad building unit entry doors (between the garage and family unit) and corresponding frames.
 - 2. Steel clad building unit entry doors (rear wall of the garage) and corresponding frames.
 - 3. Overhead garage doors.
- B. Related Sections:
 - 1. Section 06200 – Finish Carpentry: Wood casing.
 - 2. Section 08210 – Wood Doors: Wood door materials.
 - 3. Section 08700 – Finish Hardware: Door hardware.
 - 4. Section 09900 – Painting: Field painting door surfaces.

1.02 SUBMITTALS

- A. Shop Drawings: Submit schedule of door and frame sizes, types, materials, construction, finishes, anchorage, reinforcement, accessories and provisions for installing hardware.
- B. Submit manufacturer's product data for all products and accessories furnished.

1.03 QUALITY ASSURANCE

- A. Conform to the requirements of NWWDA Industry Standard I.S. 4-81 Industry Standard for Water Repellent Preservative Treatment for Millwork.
- B. Conform to ANSI/NAGDM 102 "Sectional Overhead Type Doors (latest edition) of the National Association of Garage Door Manufacturers.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in sealed, undamaged cartons.
- B. Identify each carton with material name, date of manufacture and lot number.
- C. Store doors off ground, under cover, protected from weather and construction activities.

1.05 WARRANTY

- A. Submit a written warranty signed by the door manufacturer agreeing to repair or replace doors or components that fail in materials or workmanship within the specified warranty period. Failures include structural failure including excessive deflection, water leakage, air infiltration or condensation, faulty operation of door or hardware, or deterioration of finish beyond normal weathering.
 - 1. Warranty period for doors: 1 year after project completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Clad Doors: Weather Shield “Lee Haven Steel Entry Door” as by Weather Shield Mfg., Inc. of Medford, Wisconsin, or equal.
- B. Garage Door: Atlas Roll-Lite “Model RHT-710WN” flush 4-panel door as manufactured by Atlas Roll-Lite Door Corp., Edison, NJ or equal.

2.02 INSULATED STEEL DOOR AND FRAME CONSTRUCTION

- A. Clad entry doors.
 - 1. Door Type / Style (flush door, 20 min. rated).
- B. Locations:
 - 1. Entry door from garage interior to family unit.
 - 2. Entry door on rear elevation of garage.
- C. Clad Frames: Milled from Western Pine, kiln dried to a moisture content of 6 to 12 percent at time of fabrication and treated with a water repellent preservative. Frame thickness of 1-1/8 inch at head and side jambs. Mill finished aluminum sill with vinyl thermal break and treated pine sill filler. Exterior frame surfaces are clad with extruded aluminum of 0.050 thickness with integral extruded installation fin. Standard jamb depth of 4-9/16 inch. Furnish units with factory-applied extension jamb for installation in wall assembly thickness noted on the drawings. Provide manufacturer's finish capable of accepting field painted finish under Section 09900 – Painting.
- D. Wood Frame: Milled from Western Pine, kiln dried to a moisture content of 6 to 12 percent at time of fabrication and treated with a water repellent preservative. Frame thickness of 1-1/8 inch at head and side jambs. Mill finished aluminum sill with vinyl thermal break and treated pine sill filler. Standard jamb depth of 4-9/16 inch. Furnish units with factory-applied extension jamb for installation in wall assembly thickness noted on the drawings. Provide field painted finish provided under Section 09900 – Painting.

- E. Fire Door Frame: Manufacturer's rated metal frame for fire rated door assembly and fire rating scheduled.
 - 1. Frame: "Adjust-A-Frame" as manufactured by Weathershield.
- F. Manufacturer's standard hardware for the type of door indicated as follows:
 - 1. Hinges: 3-1/2 x 4 inch primed, 1-1/2 pair per door leaf.
 - 2. Lock backset: Manufacturer's standard for doors specified.
 - a. Note that doors have 2-3/8 inch backset. Coordinate with Section 08700 – Finish Hardware.
 - 3. Weatherstripping: Duel-durometer compression vinyl weatherstripping at hinge and lock jambs and magnetic weatherstrip at head jamb. Vinyl sill sweep with four points of contact.

2.03 GARAGE DOORS

- A. Construction: Flush 4-panel type design, 1-3/4 inch thick, seamless construction, tongue and groove joint design.
 - 1. Provide roll formed commercial quality 0.010 inch hot dipped galvanized steel, both inside and out, insulated with high density polyurethane foam.
 - 2. Stiffen and reinforce core of door fully with high density polyurethane foam pressure injected at approximately 2.4 to 2.5 pounds per cubic foot.
 - 3. Intermediate reinforcing to be 16 gauge steel back-to-back plates, inserted prior to foaming, for reinforcement of attachment of applied hardware.
 - 4. Provide cap or welded closer over full width of top and bottom closing channel on doors such that insulation is completely encased. Bottom section with full length, vinyl astragal holder. Weather strip to be "U" shaped flexible extruded vinyl.
 - 5. Springs: Helical wound extension type (torsion type). Factory calibrated counterbalance to match site specifications.
 - 6. Tracks: Minimum 16 gauge galvanized steel reinforced with minimum 13 gauge galvanized angles as required. Mount tracks to wood jambs as shown.
 - 7. Hardware: Minimum 14 gauge galvanized steel hinges; full floating ballbearing rollers. Provide spring loaded sliding lock bar to engage slot in track.
 - 8. Lift Handles: For manual operation provide galvanized steel lifting handles in bottom center of door.
 - 9. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
 - a. Locking Bars: Full-disc Cremone type, both jamb sides, operable from inside and outside.
 - b. Provide lock cylinder and two keys per lock by garage door manufacturer.
 - 10. Finish coats: Manufacturer's two-coat painting process consisting of an epoxy primer and polyester top coat. Color: Refer to Exterior Color Schedule on drawings.
 - 11. Opener: Overhead Door, ½ horsepower garage door opener, Python Model OCG750 for each garage door.
 - 12. Transmitters: Two remote transmitters per garage door opener.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify rough opening requirements with the respective door manufacturer.
- B. Prepare door to receive specified hardware, including cutouts, drilling and tapping in accordance with Finish Hardware Schedule and templates provided by the Hardware supplier.

3.02 PREPARATION

- A. Prepare opening to permit correct installation of door unit with air infiltration barrier seal.

3.03 INSTALLATION

- A. Install doors, frames, garage doors, and accessories in accordance with manufacturer's data and as specified herein.
- B. Install door units plumb, level and square with no distortion of frame members. Maintain alignment with adjacent work.
- C. Ensure air infiltration barrier is sealed to door frame. Coordinate placement of insulation in shim spaces around unit perimeter as specified in Section 07210 – Building Insulation.
- D. Install sealant and related backing materials at exterior and interior of installed assembly as specified in Section 07900 – Joint Sealers.
- E. Install perimeter trim and closures.
- F. Adjust door and hardware for proper operation.

3.04 CLEANING AND PROTECTION

- A. Touch up marred or abraded surfaces to match original prime coat finish before final finishing.
- B. Adjust door and frame for smooth operation and such that clearances are not less than 1/16 inch.
- C. Clean doors, frames and glass in accordance with manufacturer's instructions.
- D. Remove labels and visible markings.
- E. Protect door units through remainder of construction.

END OF SECTION 08110

SECTION 08210

WOOD DOORS

PART 1 – GENERAL

1.01 SUMMARY

1. Provide wood doors as shown and specified. Work includes:
2. Prefit interior hardboard-faced hollow core swinging and bi-passing wood doors.

B. Related Sections:

1. Section 08110 – Steel Doors and Frames.
2. Section 08700 – Finish Hardware: Door hardware.
3. Section 09900 – Painting: Site finishing.

1.02 SUBMITTALS

A. Submit manufacturer's product data and specifications for each type of door required.

B. Shop Drawings:

1. Door Schedule: Indicate opening identification symbol, sizes, door type and grade, and show elevations, swings, cutouts, and undercuts.
2. Show details of door construction.
3. Submit sample corner section, 12 inch square, showing selected facings, stile, rail, core and edge construction.

C. Submit door trim samples, 6 inch lengths.

1.03 QUALITY ASSURANCE

A. Standards: Comply with the following:

1. National Wood Window and Door Manufacturer's Association (NWWDA) "Industry Standard for Wood Flush Doors, I.S.1 Series."

B. NWWDA Quality Marking: Mark each wood door with NWWDA Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of NWWDA I.S.1 Series.

1. For manufacturers not participating in NWWDA Hallmark Program, a certification of compliance may be substituted for marking of individual doors.
2. Hardboard-faced doors are acceptable.
3. Obtain doors from a single manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors in manufacturer's original unopened protective packaging or wrapping.
- B. Store, handle and protect doors in accordance with manufacturer's recommendations to prevent damage, wetting, soiling and deterioration.
- C. Comply with NWWDA recommendations for care and handling at the site. Store doors inside the building, flat in a dry well-ventilated area.
- D. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for doors, frames, and hardware, using temporary, removable or concealed markings.

1.05 WARRANTY

- A. Submit written warranty on door manufacturer's standard form, signed by manufacturer, installer and Contractor, agreeing to repair or replace defective doors which have warped (bow, cup, or twist), or which show telegraphing of core construction below face veneer, or delamination, or do not conform to tolerance limitations of NWWDA or other defects in materials and workmanship.
 - 1. Hollow core, panel interior doors: One year.

PART 2 – PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. Interior Hollow Core Flush Doors:
 - 1. Interior prefit door units, 1-3/8 inch thick, 6'-8" high by width scheduled.
 - 2. Construction: SHC: (Standard Hollow Core).
 - 3. Core Construction: Phenolic impregnated honeycomb with 1/2 inch cells.
 - 4. Veneer: Flush Birch (primed and paint grade).
 - 5. Adhesives: Lifetime all purpose waterproof glue, National Casein 230 Type I and 4420 Type I mixture.
 - 6. Top Rail: One piece of Douglas Fir or Aspen measuring 1-7/8" x 1-1/8" before trim and specified undercuts.
 - 7. Stiles: Two pieces of Douglas Fir or Aspen measuring 1-1/8" x 1-1/8" before trim.
 - 8. Edge Strips: Side edges; top and bottom edges hardwood of mill option.
 - 9. Face Panels: 3-ply plywood for SHC standard doors; smooth finish.
 - 10. Bi-Passing Units: Door hardware provided under Section 08700 – Finish Hardware.
- B. Frames: Two piece wood, grading for paint finish, assembled with door for pre-hung installation of single leaf hinged doors.
 - 1. Prefit to doors and hardware.
 - 2. Coordinate with door casing specified in Section 06200 – Finish Carpentry.
 - 3. Split jamb frame: 1-1/16" x 4-1/4" x 5-1/4" primed wood frame. All doors prehung, factory primed and field painted. Sizes indicated on the drawings.

4. Wood Casing: Primed wood trim on all frames.

2.02 FABRICATION

- A. Wood Doors: Fabricate doors in accordance with manufacturer's published fabrication specifications.
- B. Finish: Unfinished, sanded smooth for job site finishing provided under Section 09900 – Painting. Pre-finished doors at Contractor's option.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify door rough opening requirements with manufacturer.
- B. Prepare doors to receive specified hardware, including cutouts, drilling and tapping in accordance with final Finish Hardware Schedule and templates provide by the hardware supplier.

3.02 INSTALLATION

- A. Condition doors to average prevailing humidity in installation area before hanging.
- B. Install doors in accordance with manufacturer's printed instructions.
- C. Hang doors straight, plumb and square, securely anchored into position. Adjust doors to provide uniform clearance and to contact stops uniformly. Remove and replace doors which are warped, bowed or otherwise damaged and cannot be properly fit to the opening as directed by the Contracting Officer.

END OF SECTION 08210

This page was intentionally left blank for duplex printing.

SECTION 08630

VINYL WINDOWS

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide vinyl windows as shown and specified. Work includes:
 - 1. Vinyl egress window units in basement artic rooms.
 - 2. Shop glazing.
 - 3. Operating hardware, anchors, brackets and attachments.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry: Rough opening.
 - 2. Section 06200 – Finish Carpentry: Wood casing.
 - 3. Section 07900 – Joint Sealers.
 - 4. Section 02070 – Selective Demolition.

1.02 SUBMITTALS

- A. Submit shop drawings. Include large scale details including dimensions, relating to construction of adjacent work, vapor barrier seal to adjacent construction, component anchorage and locations, anchor methods and materials, and hardware installation details, for type of window unit required.
- B. Submit manufacturer's product information for each type of window assembly including all accessories.
- C. Submit test reports confirming compliance with all performance criteria listed under "Performance Requirements."

1.03 QUALITY ASSURANCE

- A. Standards: Conform to the requirements of AAMA 1503.1 (1988) and 101V-86. Conform to size and profile limitations as shown are based on published details of the Weathershield Corporation.
- B. Maintain continuous air and vapor barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
- C. Provide for water to drain from joints, condensation occurring in glazing channel, or migrating moisture occurring within system, to the exterior by a weep drainage network.
- D. Design sections to permit thermal expansion and contraction of plastic as compared to glass, infill, or perimeter opening construction.

1.04 SYSTEM DESCRIPTION

- A. Windows: Extruded tubular plastic sections with fusion welded frames and sashes, shop fabricated, vision glass, related flashings, and anchorage and attachments devices.

1.05 PERFORMANCE REQUIREMENTS

- A. Window units shall comply with ANSI/AAMA Class DH-R20 minimum, unless more stringent requirements are specified.
- B. Air infiltration shall not exceed 0.10 cfm per linear foot of perimeter crack tested at 1.56 psf in accordance with AAMA 101V-86, 2.1.2.
- C. No water penetration when tested at 5.25 psf according to AAMA 101V-86. 2.1.3.
- D. Windows must withstand a windload of 30 psf without damage to unit when tested according to ASTM E330.
- E. Window units must comply with rating performance for a CRF of 55.46 (standard insulating glass) when tested in accordance with AAMA 1503.1-1988.
- F. Insulating glass units must be manufactured and tested to meet requirements set forth in ASTM E774.
- G. System shall accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, and deflection of lintel.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in sealed, undamaged cartons.
- B. Identify each carton with material name, date of manufacture and lot number.
- C. Store up off ground, under cover, protected from weather and construction activities.

1.07 WARRANTY

- A. Submit a written warranty signed by the window manufacturer agreeing to repair or replace windows or components that fail in materials or workmanship within the specified warranty period. Failures include structural failure including excessive deflection, water leakage, air infiltration or condensation, faulty operation of sash or hardware, or deterioration of vinyl material and finish beyond normal weathering.
 - 1. Warranty period for windows: 1 year after project completion.
 - 2. Warranty (insulating glass): 20 year limited warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURER

- A. Provide window units as manufactured by one of the following manufacturers:
 - 1. Weather Shield Mfg., Inc. of Medford, Wisconsin; "Visions 2000 Series".
 - 2. Alside Window Systems, "Performance Series Windows".
 - 3. Quaker Window Products Co., "Alex" solid vinyl window.
 - 4. Alcoa "Magna-Frame Series" windows.
- B. Standard: Weather Shield Mfg., "Visions 2000 Series" windows were used as the basis of design and drawings dimensions, sizes, profiles and details are based on these windows. Minor deviations in size, profile, and dimensions in the products of the other named manufacturer's must be accommodated in the work if these products are selected for use.

2.02 MATERIALS

- A. Frame: Manufactured from extruded unplasticized polyvinylchloride (uPVC). Standard jamb depth is 2-1/4 inch, overall profile thickness of 3-1/32 inch, extruded into individual chambers comprising the total extrusion, with integral nailing fin. Extruded uPVC thickness of 0.067 nominal thickness, with frame corners fusion welded and cleaned.
- B. Sash: Manufactured from extruded unplasticized polyvinylchloride (uPVC). Standard sash thickness of 1-3/8 inch, extruded into individual chambers comprising the total extrusion. Extruded uPVC thickness of 0.067 nominal thickness, with sash corners fusion welded and cleaned.
- C. Insect Screens: Formed aluminum frames with baked-on acrylic coating in color to match window frame finish; injection molded corner keys, woven fiberglass mesh with charcoal finish, meeting requirements of FS L-S-125, 16/18 mesh size, held with vinyl spline.
- D. Weatherstripping: Manufacturer's standard for window type.
 - 1. Continuous woven pile weatherstripping with mylar fin around perimeter of operating sash.
 - 2. All weatherstripping factory applied.

2.03 GLAZING

- A. Glass and Glazing Materials: Glass shall be double pane insulating glass; 13/16 inch (or as standard with manufacturers window unit) clear insulating glass in compliance with IGCC Class CBA, tested in accordance with ASTM E774. Provide insulating units with a dual seal consisting of polyisobutylene as the primary seal and polyurethane as the secondary seal.

2.04 HARDWARE

- A. Manufacturer's standard hardware for the type of window required.

2.05 FABRICATION

- A. Fabricate framing and sash members with fusion welded corners and joints. Provide supplementary internal reinforcement where required for structural rigidity.
- B. Form snap in glass stops, closure molds, weather stops, and flashing of extruded PVC for tight fit into window frame section.
- C. Form weather stop flange to exterior perimeter of unit.
- D. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, enabling installation and dynamic movement of perimeter seal.
- E. Provide internal drainage weep holes and channels to migrate moisture to the exterior. Provide internal drainage of glazing spaces to exterior through weep holes.

2.06 FINISH

- A. Window frame and sash color: Manufacturer's "Painter's White."

PART 3 – EXECUTION

3.01 PREPARATION

- A. Prepare opening to permit correct installation of window unit with air infiltration barrier seal.

3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Install window units plumb, level and square with no distortion of frame members. Maintain alignment with adjacent work.
- C. Ensure air infiltration barrier is sealed to window frame. Coordinate placement of insulation in shim spaces around unit perimeter as specified in Section 07210 – Building Insulation.
- D. Install sealant and related backing materials at exterior and interior of installed assembly as specified in Section 07900 – Joint Sealers.
- E. Install perimeter trim and closures.
- F. Adjust sash and hardware for proper operation.
- G. Close and latch operating sash.

3.03 CLEANING AND PROTECTION

- A. Clean door and window frames and glass in accordance with manufacturer's instructions.

- B. Remove labels and visible markings.
- C. Protect window and door units through remainder of construction.

END OF SECTION 08630

This page was intentionally left blank for duplex printing.

SECTION 08700

FINISH HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide door hardware as shown and specified. Work includes:
 - 1. Exterior and interior swinging door hardware.
 - 2. Trim attachments, fastenings and accessories equal for complete installation.
 - 3. Furnishing templates to door and frame manufacturers for door and frame preparation.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry: Wood blocking.
 - 2. Section 08110 – Steel Clad Doors and Frames.
 - 3. Section 08210 – Wood Doors.

1.02 COORDINATION

- A. Coordinate work of this section with other directly affected Sections, informing manufacturer of any internal door reinforcement required for door hardware.
- B. Provide all items required to fully complete hardware requirements.

1.03 QUALITY ASSURANCE

- A. Manufacturers: Companies specializing in manufacturing door hardware with minimum three years experience. Provide each type of hardware from a single manufacturer for the Project.
- B. Hardware Supplier: Company specializing in supplying door hardware with three years documented experience, and employing a certified Architectural Hardware Consultant (AHC). Supplier and consultant shall be available during the course of the Work for consultation with the Contracting Officer and Contractor.
 - 1. At the completion of the Work, the AHC shall check the installation and make all minor adjustment required to ensure proper operation of finish hardware.
- C. Finish hardware specified in this section shall meet the standards of the American National Standards Institute, Inc., which is sponsored by the Builders' Hardware Manufacturers Association, Inc. (BHMA). The standards latest revision will be in effect.

1.04 SUBMITTALS

- A. Hardware Schedule: Submit finish hardware schedule for approval and include manufacturer's cut sheets on each hardware item proposed. Clearly indicate manufacturer's catalog designation and reference these to the hardware schedule.
- B. Keying Schedule: Submit a separate keying schedule for approval, indicating Government's keying requirements.
- C. Templates: The hardware supplier shall provide necessary templates to door and frame manufacturers in order to prepare their material or product to receive the hardware items. When factory installation is required, ship prepaid to the manufacturer.
- D. Provide manufacturer's product data on each item specified hardware. Include information indicating compliance with specification requirements.
- E. Submit operation and maintenance data including data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- F. Furnish maintenance tools and accessories supplied by hardware component manufacturers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify package with door opening code to match hardware schedule.
- B. Deliver keys to Contracting Officer by security shipment direct from hardware supplier.
- C. Protect hardware from theft by cataloging and storing in secure area.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Hardware as itemized, scheduled and as manufactured by the following companies, including the manufacturer's specifications for the specific item involved represents the quality, weight, function, etc., required and designates the minimum standard acceptable.

<u>PRODUCT</u>	<u>BASE SPECIFICATION</u>	<u>ACCEPTABLE MFGRS.</u>
Hinges:	Stanley	Hager, McKinney
Cylindrical Locks:	Schlage	Kwikset
Cylinders:	Schlage	Kwikset
Floor & Wall Stops:	Glynn-Johnson	Burns, Lindstrom
Sliding door hdwr.	Stanley	Johnson
Pocket door hdwr.	Johnson	Stanley
Thresholds:	National Guard Products	Pemko, Reese
Door Seals:	National Guard Products	Pemko, Reese
Viewer:	Ives	

2.02 MATERIALS AND COMPONENTS

A. Manufacturer's, Models, Sizes and Finishes:

1. See Schedule at end of section.

B. Locks and Latches:

1. Latchbolt type: Anti-friction.
2. Strike lip: Curved.
3. Strike box: Manufacturer's standard type.
4. Lock Cylinders: Equip doors scheduled with cylinders for interchangeable core pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove when directed.

C. Hinges:

1. Type: Mortise.
2. At any unusually large or heavy doors: Provide size and quantity of hinges recommended by hinge manufacturer.

D. Door Stops:

1. In lieu of scheduled wall stops or floor stops, substitute concealed overhead stays if and where:
 - a. Stops create pedestrian or vehicle traffic hazard.
 - b. 50% or more of door width projects beyond point where door contacts adjacent construction.

E. Fasteners:

1. Extent of Work: Provide all required.
2. Material and Finish: Match hardware.
3. Types:
 - a. Where applied to metal: Machine screws and bolts.
 - b. Where applied to wood: Full-thread wood screws.
 - c. Where applied to plywood or particle board: Sheet metal screws.
 - d. Through-bolting: Not permitted, unless otherwise approved by Contracting Officer's representative.
4. Head Types:
 - a. Where Exposed: Phillips.
 - b. Where concealed: Contractor's choice.

F. Keys:

1. All locks and cylinders shall be part of a new, conventional masterkey system.
2. All doors of individual building units shall be keyed alike.
3. Final keying requirements shall be determined by the Contracting Officer in a meeting with the hardware supplier for the project.

4. An Architectural Hardware Consultant (AHC) shall be available to assist the Government in making final keying decisions for the project.
5. Provide a construction masterkey system to be used during the construction process of the project.
6. All master keys shall be delivered directly to the Government by the hardware supplier.
7. Supply Keys in the following quantities:
 - a. Construction keys: 12 total.
 - b. Change keys: 2 per lock.
 - c. Master keys: As directed by Contracting Officer.

2.03 FABRICATION

- A. Lock and latch components shall be fabricated by a single manufacturer and carry that manufacturer's warranty.
- B. Fabricate strikes with extended lip where necessary to protect door frame trim against damage by latch bolt.
- C. Cut and fit and threshold or floor plates to door frame profile and with mitered corner joints. Where necessary weld multiple pieces together to form single unit. Fabricate joints with straight, smooth, and hair-line seams.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and requirements of SDI, ANSI/NFPA 80, BHMA.
- B. Fit accurately before painting, apply securely after painting, and adjust properly all materials specified herein.
- C. Use the templates provided by hardware item manufacturer. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrate for proper installation and operation. Verify that wall stops are anchored to wood stud or blocking.
- D. Coordinate hardware installation with painting and refinishing work. If cutting or fitting is required to install hardware onto or into surfaces before final finishing, remove and store hardware items before painting or finishing substrate surfaces. Reinstall hardware upon completion of surface finish work.
- E. The hardware supplier shall inspect and adjust hardware following installation. Alert Contracting Officer to any discrepancies. Verify operating parts move freely and smoothly without bonding or sticking and without excessive clearance.
- F. Prior to building occupancy, make final adjustments to hardware, and clean and lubricate. Adjust door control devices. Clean and repair hardware to restore to correct operation, function, and finish.

3.02 FINISH HARDWARE SCHEDULE

A. Provide hardware as listed in the following schedule:

1 Story Building- A3D1/2G

Heading # 1 (Garage Entry Door) (Door 06)

Schlage	(1) Entry lockset	A53PD Orbit	605 11-111 x 10-027	US3
Schlage	(1) Interchangeable by lockset manufacturer			US3
Ives	(1) Door Stop	Floor	436B3 x 435A or 438B3	US3
	(1) Butt Hinge	Full Mortise Plain Bearing Hinge		US3
	(2) Butt Hinges	Full Mortise Spring Hinges		US3

Door Butts provided be door manufacturer.

2-Piece Adjustable Threshold, and Weatherstrip provided by door manufacturer.

Heading # 2 (Standard Bathroom and Bedroom) (Doors 16, 18, 19, 20)

Schlage	(1) Privacy Set	F40N Orbit	605 11-111 x 10-027	US3
Ives	(1) Wall Stop	60A3 or (2) hinge stops per door		US3
	(3) Door Butts provided by prehung door manufacturer.			US3

Heading # 3 (Standard Closet – Single Door) (Doors 01, 02, 07, 09, 10, 17)

Schlage	(1) Passage Set	F10N Orbit	605 11-111 x 10-027	US3
Ives	(1) Wall Stop	60A3 or (2) hinge stops per door		US3
	(3) Door Butts provided by prehung door manufacturer.			US3

Heading #4 (Standard Bi-Pass Closet) (Doors 14, 15, 21)

Ives	(2) Dummy Knobs	530 - 1-1/4" dia.		US3
Stanley	(1) Track Series 8900			US26D
Stanley	(1) 116 L angle stops			US26D
Stanley	(1) 121 floor guide			US26D
Stanley	(1) 122 carpet riser			US26D

Heading # 5 (Overhead garage door) (Door 03)

Note: All hardware provided by door manufacturer

1 Story Building- A3D1/2G (Continued)

Heading # 6 (Garage sliding screen door)

	(Door 05)			
Johnson	(2) hanger & plate	200SD Series		US26D
Johnson	(1) track	200SD Series		US26D
Johnson	(2) Door guide	200SD Series		US26D
Johnson	(2) Door stop	200SD Series		US26D
Ives	(2) Door pull	177B3		US3
National				
Guard	(1) Perimeter Seal	9000A x door height		US26D
National				
Guard	(1) Door Sweep	600 x door width		US26D

Heading # 7 (Entry Doors)

	(Door 11)			
Schlage	(1) Mortise Lock	L9060 Orbit	605	US3
Ives	(1) Door Stop	Floor	436B3 x 435A or 438B3	US3
	Mortise existing solid core wood door and modify existing wood door frame for mortise lock.			

Heading # 8 (Garage Rear Entry Door)

	(Door 04)			
Schlage	(1) Deadlock	B160N	605 12-187 x 10-094	US3
Schlage	(1) Passage Set	A10S Orbit	605 11-111 x 10-027	US3
	(1) Butt Hinge	Full Mortise Plain Bearing Hinge		US3
	(2) Butt Hinges	Full Mortise Spring Hinges		US3

Door Butts provided be door manufacturer.

2-Piece Adjustable Threshold, and Weatherstrip provided by door manufacturer.

2 Story Building- A3D2/2H

Heading # 1 (Garage Entry Door) (Door 06)

Schlage	(1) Entry lockset	A53PD Orbit	605 11-111 x 10-027	US3
Schlage	(1) Interchangeable by lockset manufacturer			US3
Ives	(1) Door Stop	Floor	436B3 x 435A or 438B3	US3
	(1) Butt Hinge	Full Mortise Plain Bearing Hinge		US3
	(2) Butt Hinges	Full Mortise Spring Hinges		US3

Door Butts provided be door manufacturer.

2-Piece Adjustable Threshold, and Weatherstrip provided by door manufacturer.

Heading # 2 (Standard Bathroom and Bedroom) (Doors 12, 15, 17, 18)

Schlage	(1) Privacy Set	F40N Orbit	605 11-111 x 10-027	US3
Ives	(1) Wall Stop	60A3 or (2) hinge stops per door		US3
	(3) Door Butts provided by prehung door manufacturer.			US3

Heading # 3 (Standard Closet – Single Door) (Doors 01, 02, 09, 13, 16)

Schlage	(1) Passage Set	F10N Orbit	605 11-111 x 10-027	US3
Ives	(1) Wall Stop	0603 or (2) hinge stops per door		US3
	(3) Door Butts provided by prehung door manufacturer.			US3

Heading #4 (Standard Bi-Pass Closet) (Doors 08, 14)

Ives	(2) Dummy Knobs	530 - 1-1/4" dia.		US3
Stanley	(1) Track Series 8900			US26D
Stanley	(1) 116 L angle stops			US26D
Stanley	(1) 121 floor guide			US26D
Stanley	(1) 122 carpet riser			US26D

Heading # 5 (Overhead garage door) (Door 03)

Note: All hardware provided by door manufacturer

2 Story Building- A3D2/2H (Continued)

Heading # 6 (Garage sliding screen door) (Door 05)

Johnson	(2) hanger & plate	200SD Series	US26D
Johnson	(1) track	200SD Series	US26D
Johnson	(2) Door guide	200SD Series	US26D
Johnson	(2) Door stop	200SD Series	US26D
Ives	(2) Door pull	177B3	US3
National Guard	(1) Perimeter Seal	9000A x door height	US26D
National Guard	(1) Door Sweep	600 x door width	US26D

Heading # 7 (Entry Doors) (Door 10)

Schlage	(1) Mortise Lock	L9060 Orbit	605	US3
Ives	(1) Door Stop	Floor	436B3 x 435A or 438B3	US3
Mortise existing solid core wood door and modify existing wood door frame for mortise lock.				

Heading # 8 (Garage Rear Entry Door) (Door 04)

Schlage	(1) Deadlock	B160N	605 12-187 x 10-094	US3
Schlage	(1) Passage Set	A10S Orbit	605 11-111 x 10-027	US3
	(1) Butt Hinge	Full Mortise Plain Bearing Hinge		US3
	(2) Butt Hinges	Full Mortise Spring Hinges		US3

Door Butts provided be door manufacturer.

2-Piece Adjustable Threshold, and Weatherstrip provided by door manufacturer.

END OF SECTION 08700

END OF SECTION

SECTION 09260
GYPSUM BOARD SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide gypsum board systems and finishes as shown and specified.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry.
 - 2. Section 07210 – Building Insulation.
 - 3. Section 09900 – Painting: Paint coatings on gypsum board.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each gypsum board system component.

1.03 QUALITY ASSURANCE

- A. Gypsum board system standards:
 - 1. Materials: Comply with Gypsum Association GA–201 "Using Gypsum Board for Walls and Ceilings."
 - 2. Application and finishing: Comply with Gypsum Association GA–216 "Recommended Specifications for Application and Finishing of Gypsum Board."
- B. Single Source Responsibility for Panel Products, Framing, and Finishing Materials: Obtain gypsum board panel products, framing, and finishing materials each from a single manufacturer; finishing products from manufacturer of gypsum board or a manufacturer acceptable to the gypsum board manufacturer. Use same manufacturer's products throughout project.
- C. Where work is indicated to comply with fire-resistance ratings, provide materials and installations identical to applicable tested and listed assemblies.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened labeled containers. Deliver fire-rated materials bearing testing agency label and required fire resistance classification numbers.
- B. Store, protect, and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling, and deterioration.

1.05 PROJECT CONDITIONS

- A. Do not proceed with gypsum board installation until blocking, framing, bracing, and other supports for work to be subsequently applied, have been installed, reviewed, and accepted by the Contracting Officer. Do not install gypsum board until other work concealed by gypsum board have been installed.
- B. Maintain uniform building temperature range not less than 55°F. for 24 hours before, during, and after gypsum panel installation and joint finishing treatment.
- C. Provide adequate lighting and ventilation during installation and joint finishing treatment. Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent finishing materials from drying too rapidly.
- D. Protect adjoining surfaces against damage and soiling.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Gypsum Board: Provide products of one of the following manufacturers:
 - 1. United States Gypsum Co., Chicago, IL.
 - 2. Gold Bond Building Products, Charlotte, NC.
 - 3. Georgia Pacific Corp., Decatur, GA.

2.02 MATERIALS AND COMPONENTS

- A. Gypsum board panels: USG tapered edge face panels, 48 inch wide, in maximum lengths available to minimize end joint conditions, thickness indicated:
 - 1. Standard panels: ASTM C36 Sheetrock Regular panels.
 - a. 5/8 inch thickness on ceilings.
 - b. 1/2 inch thickness on walls.
 - 2. Fire-rated panels: ASTM C36 Sheetrock Firecode panels.
 - a. 5/8 inch thickness.
 - 3. Moisture-resistant panels: ASTM C630 Sheetrock W/R panels.
 - a. 1/2 inch thickness on non-fire rated walls.
 - 4. Moisture-resistant and fire-rated panels: ASTM C36 Sheetrock W/R panels.
 - a. 5/8 inch thickness.

- B. Fasteners for Wood Framing: Comply with GA 216. USG Type "W" bugle head screws for wood framing, manufacturer's recommended length for panel thickness indicated.
- C. Trim: Provide manufacturer's standard trim of types required for gypsum board work, galvanized steel with knurled and perforated or expanded metal flanges, beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge beads, U-type edge beads, special L-Kerf-type edge beads. Semi-finishing J-type trim not permitted.
- D. Joint treatment: Comply with ASTM C475. Provide USG Sheetrock Joint Treatment System, utilizing ready-mixed vinyl type for tape bedding for topping.
 - 1. Water-resistant panels: USG Sheetrock Brand W/R compound special water-resistant type for treatment of joints, fasteners, and cut edges of water-resistant panels.

PART 3 – EXECUTION

3.01 GYPSUM BOARD INSTALLATION

- A. Comply with Gypsum Association GA 216 "Recommended Specifications for the Application and Finishing of Gypsum Board." Screw fasten gypsum board panels.
- B. Locate exposed end-butt joints as far from center of walls and ceilings as possible and stagger not less than 1'-0" in alternate courses of board.
- C. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/8 inch open space between boards. Do not force into place.
- D. Locate either edges or end joints over supports. Position boards so that both tapered edge joints abut. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- E. Attach gypsum board to framing and blocking as required for additional support at openings and cutouts.
- F. Floating construction: Install gypsum board with "floating" internal corner construction, unless isolation of the intersecting board is indicated.
- G. In addition to compliance with the standards, comply with specific requirements indicated for each type or arrangement of gypsum board system shown. Space fasteners in accordance with manufacturer's recommendations and complying with referenced standards.
 - 1. Single-layer ceilings: Apply gypsum board on ceilings, before application on walls and partitions. Install in direction and manner to minimize end joints. Stagger end joints over supports.
 - 2. Single-layer walls and partitions: Apply sheets horizontally or vertically. Provide maximum sheet lengths to minimize end joints with edges or ends over supports.
 - 3. Fire-rated assemblies: Provide materials and installation identical to tested and listed assemblies.
 - 4. Moisture-resistant panels: Provide W/R panels at scheduled fiberglass tub surround areas extending continuous from floor to ceilings. At shower and tub recesses apply uncut long edge at bottom edge of work, spaced 1/4" above fixture lip. Precut panels to

required sizes and treat necessary edges at penetrations, joints, and intersections before panel installation with Sheetrock W/R compound. Treat all fastener heads with Sheetrock W/R compound after installation. Fill all openings around pipes, fittings, and fixtures with Sheetrock W/R compound before ceramic tile installation.

5. Cut and install panels to eliminate vertical joints in corners of door frames to ceiling.
6. Make cutouts to fit within wall plate, register, and grille flanges. All cutouts made by knife or saw.
7. Make angles and corners clean, true, plumb, and square; walls plumb, flat, and straight and ceilings flat and level.

3.02 TRIM AND ACCESSORIES

- A. Install metal corner beads at external corners of gypsum board work. Use longest practical lengths.
- B. Install metal edge trim wherever edge of gypsum board would be exposed or semi-exposed. Provide control joints where indicated or required.

3.03 FINISHING

- A. Comply with manufacturer's instructions for mixing, handling, and application of materials. Apply treatment at joints both directions, at flanges of trim accessories, penetrations of gypsum board (electrical boxes, piping, and similar work), fastener heads, surface defects, and elsewhere as indicated. Apply in manner which will result in each of these items being concealed when applied decoration has been completed.
- B. Provide knock down finish on all walls and ceilings.
- C. Apply joint tape at joints between gypsum boards.
- D. Do not use topping compound for bedding joint tape.
- E. Apply joint compound in three coats and sand between two last coats and after last coat.
- F. Do not use bedding compound for the final coat of joint treatment, unless specifically recommended by the manufacturer for that use.

END OF SECTION 09260

SECTION 09650

RESILIENT FLOORING

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide resilient flooring as shown and specified. Work includes:
 - 1. Resilient sheet flooring.
 - 2. Resilient base.
 - 3. Edge strips, adhesives, and accessories to complete the work.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry: Underlayment.
 - 2. Section 06200 – Finish Carpentry: Wood base.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of resilient flooring, base and accessory required.
- B. Submit 6 inch by 9 inch samples of resilient sheet flooring of each type, color and pattern selected to illustrate the full range of color variations. Provide 6 inch lengths of base and edge strip accessories.
- C. Submit manufacturer's certification that resilient flooring furnished has been tested and complies with required fire test performance requirements.
- D. Submit manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring, base and accessory material required, for Contracting Officer's use.

1.03 QUALITY ASSURANCE

- A. Provide each type of resilient flooring, base and accessory material produced by one manufacturer, including recommended primers, adhesives, sealants and leveling compounds. Provide all materials from same production run. Colors shall be uniform throughout.
- B. Resilient flooring installation: Performed by experienced floor covering installers, trained and approved by resilient flooring manufacturer.
- C. Fire test performance: Provide resilient flooring materials complying with referenced standard fire tests.
 - 1. ASTM E662 Smoke: Specific optical density, less than 450.

2. ASTM E648 (Radiant Panel): Critical Radiant Flux, Class 1, greater than 0.45 watts/sq.cm.

D. Static Load Limit:

1. ASTM F 970: 100 lbs./sq. inch.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened labeled containers.
- B. Store, protect and handle resilient flooring materials in accordance with manufacturer's recommendations to prevent damage, soiling and deterioration.
- C. Store materials in areas to receive resilient flooring for a minimum of 48 hours before installation.

1.05 PROJECT CONDITIONS

- A. Maintain uniform room temperature range not less than 70 degrees F. in areas to receive resilient flooring for minimum 48 hours before installation and 48 hours after installation.
- B. Provide adequate lighting and ventilation during installation and clean-up.
- C. Protect adjoining surfaces from damage and soiling.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers that offer products which may comply with the requirements of this project include but are not limited to the following:
 1. Armstrong World Industries or approved equal.
 2. Mannington Mills, Inc. of Mississauga, Ontario.

2.02 RESILIENT FLOORING MATERIALS

- A. Colors and patterns: Armstrong Commission 80135.
- B. Vinyl sheet flooring: Armstrong Commission with backing, with 12'-0" wide rolls with three year warranty and manufactured by Armstrong World Industries, Inc.
 1. Form: 12 foot wide, up to 90 feet in length.
 2. Gauge: 0.085 inch overall and 0.025 inch wearlayer.
 3. Reference specifications: ASTM F 1303, Type I, Grade A backing.

C. Vinyl Wall Base: Product complying with FS SS-W-40, Type II, and as follows:

1. Standard: Johnsonite
2. Style: Cove at sheet vinyl.
3. Thickness: 0.080 inch.
4. Height: 4 inches.
5. Lengths: Coils in lengths standard with the manufacturer.
6. Corners: Job formed.
7. Colors: As scheduled in Interior Color Schedule on drawings.

2.03 ACCESSORIES

- A. Edge strips: Solid vinyl or rubber composition, tapered or bullnose, color matching flooring, not less than 1 inch wide.
- B. Primer: Non-staining type, compatible with adhesive, as recommended by flooring manufacturer.
- C. Leveling compound: Non-staining latex type, compatible with flooring, as recommended by the flooring manufacturer.
- D. Adhesives: Waterproof, stabilized type as recommended by the resilient flooring manufacturer to suit material and substrate condition.
- E. Cleaning and finishing materials: Neutral cleaner, non-slip wax finish as recommended by the floor material manufacturer.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Before installing flooring, broom or vacuum clean substrate surfaces and inspect the subfloor substrates.
 1. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions.
 2. Perform bond and moisture tests on concrete slabs to determine that concrete surfaces are sufficiently cured and are ready to receive flooring.
 3. Verify wood underlayment surface is free of surface irregularities and substances with potential to interfere with adhesive bond, show through surface, or stain sheet vinyl floor coverings.
 4. Apply primer, if recommended by flooring manufacturer, before application of adhesive. Apply in compliance with manufacturer's recommendations.
- B. Install resilient flooring only after all finishing operations, including painting, have been completed and permanent heating and ventilating systems are operating. Building air temperature and relative humidity shall be within resilient flooring manufacturer's recommended limits.

3.02 INSTALLATION

- A. Install resilient flooring and accessories with perimeter adhesive system in strict compliance with the manufacturer's recommendations. Butt tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions and to produce neat joints, laid tight, even and straight. Extend flooring into toe spaces, door reveals and into closets and similar openings.
- B. Resilient sheet flooring:
 - 1. Lay resilient sheet flooring to provide as few seams as possible with the most economical use of materials. Match edges for color shading at seams in compliance with manufacturer's recommendations.
 - 2. Adhere resilient sheet flooring to substrate with adhesive as recommended by the manufacturer, without open cracks, voids, raising, or puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.
 - 3. Prepare seams in vinyl sheet flooring in accordance with manufacturer's instructions for most inconspicuous appearance, sealing continuously with fluid-applied sealant or adhesive as standard with manufacturer to provide a "seamless" installation.
 - 4. Roll installed resilient sheet flooring with 150 lb. sectional roller until a firm, uniform bond has been obtained.
- C. Install wall base at walls and casework as scheduled. Install in as long lengths as practicable. Job form corners, mitered outside corners not acceptable. Provide joints not closer than 18 inches from corners. Install wall base at all kitchen and bath cabinets.
 - 1. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
- D. Install edge strips at every location where resilient flooring terminates without covering thresholds or where edges would otherwise be exposed. Center under door level at openings.
 - 1. Provide resilient edge strips tightly butted to flooring and secured with adhesive.

3.03 CLEANING

- A. After flooring has set, clean thoroughly. Remove excess adhesive or other surface blemishes from flooring, using neutral type cleaners as recommended by the flooring manufacturer. Apply one coat of non-slip wax finish and buff.

END OF SECTION 09650

SECTION 09680

CARPET

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide carpeting as shown and specified.
- B. Related Sections:
 - 1. Section 09650 – Resilient Flooring: Resilient base.

1.02 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of carpet, carpet cushion and accessory required.
- B. Submit 18 inch by 18 inch carpet samples for each carpet type, color and pattern required. Show construction, color and pattern.
 - 1. Submit 6 inch lengths of edge trim and edge guards.
 - 2. Submit 6 inch by 6 inch carpet cushion samples.
- C. Submit manufacturer's certification or certified test laboratory reports indicating carpet material compliance with specification requirements.
- D. Submit carpet manufacturer's written instructions for recommended maintenance practices for each type of carpet required. Include recommendations for cleaning carpet and precautions against materials and methods which may be detrimental to carpet materials.

1.03 QUALITY ASSURANCE

- A. Installation: Performed by skilled commercial carpet layers with not less than five years of experience installing carpet equal in quality and extent required for the project work.
- B. Workmanship: Comply with Carpet and Rug Institute (CRI) "Specifier's Guide for Contract Carpet Installation."
- C. Provide each type of carpet from same production run. Colors shall be uniform throughout.
- D. Provide 10-year wear warranty.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver carpet materials in manufacturer's standard protective wrappings or cartons.

- B. Store carpet materials inside the building in dry, well-ventilated spaces. Store, protect and handle materials in accordance with manufacturer's recommendations to prevent damage, soiling and deterioration.
- C. Coordinate delivery schedule and storage space locations with the Contracting Officer.

1.05 PROJECT CONDITIONS

- A. Do not start carpet installation until painting, finishing and ceiling work is complete and overhead mechanical and electrical work tested, completed and accepted.
- B. Maintain uniform room temperature of minimum 60°F. and humidity of 20 percent to 40 percent for 24 hours before, during and continuously after installation.
- C. Provide adequate lighting and ventilation during installation and clean-up.
- D. Protect adjoining surfaces from damage and soiling.

1.06 WARRANTY

- A. Carpeting:
 - 1. Submit manufacturer's ten year written wear warranty.
 - 2. Submit manufacturer's written static control warranty.

1.07 MAINTENANCE

- A. Deliver usable scraps of carpet to Contracting Officer's designated storage space, properly packaged and identified. Usable scraps are defined to include roll ends of less than 9'-0" length, pieces of more than 3 sq.ft. area and more than 8 inch wide. Dispose of smaller pieces as waste materials.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, products which may be incorporated in the work include products of the following manufacturers or equal:
- B. Carpet 1: Patcraft Commercial Carpet, Division of Queen Carpet Corp., Dalton, GA, Tel. (706) 277-2133 or equal.

2.02 CARPET 1: PERFORMANCE CRITERIA

- A. Carpet 1: Patcraft Commercial Carpet, Revenue Increase 00734-00109.
- B. Construction complying with the following specifications:

1. Tufted yarn weight: 30 oz.
2. Dye method: Piece dyed.
3. Construction: Multi-colored tufted cut pile.
4. Fiber: DuPont Solutia 6,6 nylon with permanent soil resistant technology.
5. Finished pile height: 0.312 inch.
6. Stitches per inch: 8.
7. Gauge: 1/8 inch.
8. Density (Yarn Weight x 36/pile height): 4608 oz/yd3.
9. Primary backing: Woven Polypropylene.
10. Width: 12 feet.

C. Carpet performance:

1. Carpet flammability:
 - a. DOC FF-1-70 (Pill Test): Passes.
 - b. ASTM E648 (Radiant Panel): Class I.
 - c. ASTM E662 (Smoke Density): Less than 450.

2.03 CARPET CUSHION

- A. Carpet cushion: FS L-C-1369 bonded urethane foam, passing pill test for flammability ASTM D2859 or tunnel test ASTM E84, rated 0-75. Density not less than 8 lb./cu.ft., thickness not less than 1/2 inch.

2.04 ACCESSORIES

- A. Tackless carpet stripping: Water-resistant plywood strips, thickness as required to match cushion thickness, with angular pins protruding from top designed to grip and hold stretched carpet at the backing. Provide narrow stripping with two rows of pins where stretched width of carpet is 20'-0" or less, wide stripping with three rows of pins where carpet width exceeds 20'-0".
- B. Carpet edge guard: Extruded aluminum bend-down type edge guard, with concealed gripper teeth and punched anchorage flange. Color selected by Contracting Officer.
- C. Seaming cement: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.
- D. Miscellaneous materials: As recommended by manufacturers of carpet and other carpeting products; and selected by installer to meet project requirements.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Field verify measurements. Do not scale drawings or calculate sizes from dimensions shown.

B. Before installing carpeting, clean and inspect substrate surfaces.

1. Clear away debris, scrape up cementitious deposits; remove dust, dirt, oil, grease and other substances detrimental to proper performance of adhesives and carpet.
2. Use leveling compound as recommended by carpet manufacturer for filling small cracks and depressions.
3. Perform bond and moisture tests on concrete slabs to determine that concrete surfaces are sufficient cured, sealed and ready to receive carpet. Apply sealer where required to prevent dusting.
4. Vacuum clean immediately before carpet installation.

3.02 INSTALLATION: CARPET

A. General:

1. Comply with manufacturer's installation instructions and recommendations seam locations and direction of carpet; maintain uniformity of direction and lay of pile.
2. Install carpet edge guard at locations where edge of carpet is exposed to traffic and adjacent floor materials. Provide single lengths wherever possible.
3. Provide seams minimum 12'-0" apart. Avoid cross seaming wherever possible. Where cross seams are required, locate in low traffic areas. No cross seaming acceptable in doorways. Bead and seal all seams.
4. Center door cutouts under door when in closed position.
5. Lay out rolls of carpet full for Contracting Officer acceptance. Check carpet before cutting and ensure there is no visible variation between dye lots.
6. Cut carpet, when required, in a manner to allow proper seam and pattern match. Provide cuts straight, true and free of frayed edges.
7. Sequence carpeting with other work to minimize possibility of carpet damage and soiling during remaining construction period.
8. Extend carpet under open-bottomed obstructions, under removable flanges and furnishings and into alcoves and closets of each space.

B. Stretch-in-tackless installation:

1. Install tackless carpet stripping at entire perimeter of each carpeted space and at obstructions or cut-outs.
2. Install carpet cushion. Use maximum size pieces, run cushion seams at 90° angle to carpet seams. Cement to substrate in accordance with manufacturer's recommendations, except staple to wood substrates. Tape cushion seams.
3. Install carpet by trimming edges, buttering cuts with seaming cement, taping or sewing or taping-and-sewing seams to provide sufficient strength for stretching and continued stresses during life of carpet. Apply seaming cement over stitching on backing, if not covered by tape.
4. Stretch carpet and secure to carpet stripping. Conceal trim edges. Stretch carpet both directions, the exact amount recommended by carpet manufacturer.

3.03 CLEANING

- A. On completion of installation, remove all dirt from surface of carpet. Clean with beater-type vacuum cleaner. Remove soiled spots and adhesive on carpet with proper remover. Remove all loose pieces of face yarn with sharp scissors.

CN01 RPR MFH HOLLY PH1 (30UN)
GRAND FORKS AFB ND

SOLICITATION NO. DACA45-02-B-0005

END OF SECTION 09680

This page was intentionally left blank for duplex printing.

SECTION 09900

PAINTING

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide painting as shown and specified. Work includes:
 - 1. Coating system materials, including sealers, primers, stains, fillers, emulsions, enamels, and other applied materials used as prime, intermediate and finish coats and the application of these materials.
 - 2. Surface preparation, prime, intermediate and finish coatings for interior and exterior scheduled surfaces and items.

1.02 SUBMITTALS

- A. Submit a complete schedule identifying manufacturer and specific brand name or number of products proposed for finishing specified surfaces.
 - 1. Provide percent of solids by volume content data for each paint material.
 - 2. Provide paint label analysis and application instructions for each paint material.
- B. Before beginning work, prepare duplicate samples on actual materials for Contracting Officer review of color and texture. Provide complete finish on one-half of surface, successive applications required to produce finish on other half. Label and identify sample locations and applications. Sample size: 12 inch by 12 inch. Use representative colors when preparing samples for review. Resubmit until required sheen, color and texture are accepted. Include the following:
 - 1. Painted wood: Provide two 12" x 12" samples on specified wood for each color and finish.
 - 2. Stained: Provide two 4" x 8" samples on specified wood for each type of stained wood finish required.
 - 3. Gypsum board: Provide two 12" x 12" samples for each color and finish.
 - 4. Ferrous metal: Provide two 4" x 4" samples of flat metal and two 8" long samples of solid metal for each color and finish.
 - 5. Zinc-coated metal: Provide two 4" x 4" samples of flat metal and two 8" long samples of solid metal for each color and finish.
 - 6. Additional items as directed by Contracting Officer.
- C. Submit manufacturer's and installer's certification that paint materials supplied for project use comply with specification requirements.

1.03 QUALITY ASSURANCE

- A. Single source responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats. Provide all coatings of a single manufacturer for the project.
- B. Application: Performed only by skilled, experienced painters.
- C. Provide lead free prime and finish coatings. All top coatings shall be mold and mildew resistant.
- D. Provide field samples of paint coatings under provisions of Section 01400 – Quality Control.
 - 1. Provide field sample panel of minimum 100 square feet in size for wall and ceiling surfaces, and 12 inch long sample of coatings on equipment or metallic items, illustrating coating color, texture, and finish, and workmanship.
 - 2. Locate samples in areas designated by the Contracting Officer. Finish the area in accordance with specification requirements for applicable substrate surfaces and items.
 - 3. When accepted by the Contracting Officer, the sample area shall serve as the project standard for painting work.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened labeled containers.
- B. Store materials in a suitable locations. Store, protect and handle materials in accordance with manufacturer's recommendations to prevent damage and deterioration. Store paint materials at minimum temperature of 50 degrees F.
- C. Maintain paint material storage spaces clean, non-hazardous and orderly. Place waste and soiled paint rags in tightly covered metal containers; safely dispose of at end of each working day. Take every precaution to avoid fire hazards and spontaneous combustion. Provide acceptable type of fire extinguisher immediately adjacent to paint storage areas.

1.05 PROJECT CONDITIONS

- A. A complete schedule of finishes and colors will be provided by Contracting Officer before beginning painting work.
 - 1. Paint all exposed surfaces, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically indicated in "schedules," paint the same as similar adjacent materials or surfaces. If a color or finish is not designated, Contracting Officer will select from standard colors or finishes available.
- B. Coordinate painting and finishing work with other trades to ensure adequate illumination, ventilation and dust-free environment during application and drying of paint and finish treatments.
- C. Comply with material manufacturer's recommended temperature and environmental limitations for painting and finishing applications.
 - 1. Apply paint and finish materials only when temperature of surfaces to be finished and surrounding air temperatures are between 50 degrees F. and 90 degrees F., except as otherwise permitted by manufacturer's printed directions.

2. Do not apply exterior materials in snow, rain, or fog, or to frozen, damp, or wet surfaces. Allow wet surfaces to dry and attain indicated temperatures and conditions before proceeding with the work. Avoid finishing surfaces directly exposed to hot sun.
 3. Provide necessary protection, enclosures and temporary heat and ventilation during inclement weather to permit proper application and drying of paint coatings and finishing treatments.
- D. Maintain uniform interior building temperature of minimum 65 degrees F. and humidity of 20 to 40 percent for 24 hours before, during and continuously after painting.
- E. Provide adequate ventilation as required for specified paint and finish treatment materials in spaces scheduled. Maintain for time periods recommended by material manufacturer to provide proper drying.
- F. Provide adequate illumination on surfaces to be finished. Maintain a minimum 15 foot-candle lighting level.
- G. Protect adjoining surfaces against damage or soiling.
- H. Maintain work in neat and orderly condition, promptly removing empty containers, wrappings, soiled rags, waste, and rubbish from site.
- I. Verify location and extent of spray texture finishes at ceiling surfaces as required for the work.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Sherwin-Williams Co. (SW), Cleveland, OH or equal products of Pratt & Lambert, or Benjamin Moore.

2.02 MATERIALS

- A. Paint materials: Provide best quality grade, first line products of coating types scheduled, regularly manufactured by an acceptable paint materials manufacturer.
1. Equal products shall contain not less than an equal percentage of solids by volume content of products specified.
 2. Color pigments: Pure, non-fading, applicable types to suit substrates and service indicated. Provide pigments fully ground, maintaining a soft paste consistency in the vehicle during storage, readily and uniformly dispersed by paddle to a complete homogeneous mixture ready for use.
 3. Provide base and intermediate coat products compatible with finish coat and as produced by manufacturer of finish coat.
 4. Provide ready-mixed paint. Job mixing and tinting not acceptable, except as directed by Contracting Officer.
 5. Paint materials shall have good flowing and brushing properties, dry or cure free of streaks or sags and yield desired finish specified.

- B. Paint accessory materials: Provide linseed oil, shellac, thinners, or other accessory materials required for the work. Use only materials of best quality, approved by paint manufacturer and used within paint manufacturer's recommended limits.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Remove or protect during painting, finish hardware, accessories, mechanical grilles and louvers, electrical devices and plates, fixtures and similar items installed before painting and not required to be painted. Store, clean and replace on completion of painting work in each area.
- B. Provide shields, protective coverings and drop cloths. Protect floors and adjacent work and materials. Remove and properly replace temporary protection and coverings removed from any part of the work or finish. Repair damage at Contractor's expense.
- C. Clean and prepare substrate surfaces in accordance with manufacturer's instructions for each particular substrate condition. Remove oil and grease before mechanical cleaning. Clean and correct defects and deficiencies in substrate surfaces to be painted before applying paint or finish treatments.
- D. Do not paint over dirt, rust, scale, grease, oil, moisture, marred surfaces, mildew or other conditions detrimental to formation of a durable paint film.
- E. Mildew removal: Scrub surfaces with tri-sodium phosphate and bleach solution, rinse with clean potable water and allow to dry thoroughly.
- F. Ferrous metals: Clean metal surfaces by solvent or mechanical cleaning. Remove oil, grease, dirt, loose mill scale and other foreign materials.
 - 1. Touch-up damaged, field welded and bare areas of shop applied prime coats. Touch-up with metal primer compatible with shop primer and finish coats.
 - 2. Remove shoulders at edge of sound paint to prevent photographing through finish coats.
 - 3. Remove dirt and grease on galvanized surfaces scheduled for paint finish with solvent or chemical washes. Wipe dry with clean cloths.
- G. Gypsum board: Remove dust, dirt, loose and other foreign material. Fill hairline cracks, holes and other defects with filler compatible with finish treatment. Sand smooth.
- H. Wood: Remove dust, dirt and grit. Clean soiled wood surfaces. Sand exposed surfaces to smooth even surface and dust clean.
 - 1. Seal resinous sapwood, knots and pitch streaks with recommended sealer before applying prime coat.
 - 2. After priming, fill nail holes, cracks, open joints and other defects with filler compatible with finish treatment. Sand filler smooth, ready for finish coats.

3.02 APPLICATION: GENERAL

- A. Mix, prepare, and apply paint and finish treatment materials in accordance with manufacturer's directions.
- B. Apply paint and finish treatment materials with brush or roller. Spray application of materials permitted only when specifically indicated or acceptable to Contracting Officer.
 - 1. Rate of application shall not exceed manufacturer's surface involved. Apply each coat of proper consistency.
 - 2. Keep brushes and rollers clean, free from contamination and suitable for the finish required.
 - 3. Comply with manufacturer's recommendations for drying time between succeeding coats.
 - 4. Sand lightly between coats to achieve required finish.
 - 5. Finished surfaces shall be uniform in finish and color and free of brush marks, sagging, holidays, corduroy and other imperfections. If a coat is judged unsatisfactory, sand or otherwise clean off unsatisfactory coat and apply another coat.
 - 6. Coverage and hide shall be complete. Apply additional coatings when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color, appearance and coverage.
 - 7. Finish film thickness: Apply materials at not less than the manufacturer's recommended spreading rate, to provide a total dry film thickness as scheduled. When not indicated, dry film thickness shall be as recommended by material manufacturer.
- C. Priming and back priming exterior wood products:
 - 1. Surfaces to receive paint finish: Prime and back prime exterior finish wood products, before installation, with exterior wood prime paint. After doors are fit to frames, but before installation, apply not less than one coat of wood prime paint and one coat of finish paint to top and bottom of each door. After windows and sash are fit to their frames, but before installation, prime ends and edges normally concealed with one coat of exterior wood prime paint.
 - 2. Surfaces to receive stain finish: Prime and back prime faces, edges and ends, with first coat of stain before installation.
- D. Priming interior wood products:
 - 1. Surfaces to receive paint finish: Prime interior finish wood products, before their installation, with interior wood prime paint. After doors are fit to their frames, but before installation, apply one coat of interior wood prime paint and one coat of interior finish paint to top and bottom edges.
- E. Tops, bottoms and edges of metal and wood doors shall be painted with same materials and number of coats as used on door faces.
- F. Edges of paint or finish adjoining other materials or colors shall be sharp and clean without overlapping.

3.03 APPLICATION: EXTERIOR PAINT AND FINISH MATERIALS

- A. Paint and finish exposed exterior metals, including structural steel, lintels, sheet metal flashings, railings, handrails, gratings, doors, door frames and all unfinished, shop primed and galvanized finish ferrous metals.

1. Factory finished flashing, sheet metal, roof accessories, louvers and other factory finished metals to remain as finished.
 2. Paint exterior mechanical and electrical metal work, including exposed portions of vents, stacks, fittings, air intakes, exhausts, fan housings, louvers, rooftop equipment, meters, piping, transformers and equipment exposed to view as directed by Contracting Officer.
- B. Paint and finish for exposed exterior wood.
1. Provide stain finish for wood fencing where indicated.
 2. Provide painted finish for wood doors, and all unfinished or factory primed wood materials.

3.04 APPLICATION: INTERIOR PAINT AND FINISH MATERIALS

- A. Paint and finish walls and ceilings of interior spaces.
1. Finish alcoves, recesses and closets, not specified otherwise, with same treatment as scheduled for adjacent areas.
 2. Finish back wall surface of such items as open shelving and exposed heating units, with same treatment as balance of wall.
 3. Paint access panels and other unfinished panels which occur in walls to match the surface in which they are mounted. If panels occur in the unpainted surfaces, paint as directed by Contracting Officer.
 4. Finish returns, edges and recesses exposed in finished work to match adjoining work.
 5. New walls and ceilings are to have the same texture as adjacent existing walls and ceilings.
- B. Paint and finish exposed interior shop primed or galvanized finish ferrous metals.
1. Paint unfinished and factory primed mechanical and electrical work, including registers, grilles, piping, ductwork, conduit and equipment, except at mechanical and electrical rooms, as directed by Contracting Officer.
- C. Paint and finish interior wood.
1. Provide painted finish for wood doors, door frames, wood trim casing and base and handrails.
 2. Provide painted finish for wood shelving and trim and elsewhere as indicated at closet, service and storage areas.

3.05 CLEANING AND PROTECTION

- A. During progress of the work and upon completion, promptly clean adjacent surfaces and materials of spills, spatters, drips and stains from painting application. Remove paint by proper methods exercising care to prevent damage to finished surfaces and materials.
- B. Protect work of other trades against damage resulting from painting and finishing work. Correct damage by cleaning, repairing or replacing and repainting as acceptable to the Contracting Officer.
- C. Replace, clean and adjust finish hardware, accessories, mechanical grilles and louvers, electrical plates, fixtures and similar items removed for painting work.

- D. Touch-up damaged painted surfaces before final project acceptance.
- E. Perform cleaning during progress of the work and upon completion of the work. Remove from site excess materials, debris, tools and equipment.

3.06 EXTERIOR PAINT AND FINISH MATERIALS SCHEDULE

Note: Colors as scheduled or noted on drawings.

- A. Apply paint and finish materials to substrate surfaces indicated. Apply touch-up prime coats in addition to shop-applied prime coats. Provide additional job site prime coats when indicated.
- B. Surfaces not to be painted:
 - 1. Prefinished metals.
 - 2. Items with factory-applied finish, except as specifically noted otherwise.
- C. Ferrous metal, painted: Primer is not required on shop-primed items.
 - 1. Full gloss alkyd enamel: 1 finish coat over primer with total dry film thickness not less than 5.0 mils.
 - 2. Primer: S-W Kem Kromik Metal Primer B50 Series.
 - 3. Finish coat: S-W Industrial Enamel B54 Series.
- D. Ferrous metal, galvanized: Primer is not required on shop-primed items.
 - 1. Full gloss alkyd enamel: 1 finish coat over primer with total dry film thickness not less than 4.0 mils.
 - a. Primer: S-W Galvite Paint B50W3.
 - b. Finish coat: S-W SWP Gloss House and Trim, A2 Series.
- E. Aluminum, painted:
 - 1. High gloss alkyd enamel: 1 finish coat over primer with total dry film thickness not less than 4.0 mils.
 - a. Primer: S-W DTM Wash Primer B71 Series.
 - b. Finish coat: S-W Industrial Enamel B54 Series.
- F. Wood, painted:
 - 1. Alkyd gloss enamel: 1 finish coat over primer with total dry film thickness not less than 4.4 mils.
 - a. Primer: S-W A-100 Exterior Alkyd Wood Primer.
 - b. Finish coat: S-W Exterior Gloss A2 Series.
- G. Wood fencing, stained:
 - 1. Low luster finish: 1 coat.

- a. Finish coat: S-W Exterior Solid Stain A14 Series.

3.07 INTERIOR PAINT AND FINISH MATERIALS SCHEDULE

Note: Colors as scheduled or noted on drawings.

- A. Apply paint and finish materials to substrate surfaces indicated. Apply touch-up prime coats in addition to shop-applied prime coats. Provide additional job site prime coats when indicated.
- B. Surfaces not to be painted:
 - 1. Prefinished floor coverings.
 - 2. Prefinished metals.
 - 3. Items with factory-applied finish, except as specifically noted otherwise.
- C. Gypsum board, painted:
 - 1. Walls: Interior latex semi-gloss enamel finish: 1 finish coat over primer with total dry film thickness not less than 1.3 mils per coat.
 - a. Primer: S-W Pro-Mar 400 Latex Wall Primer B31W401.
 - b. Finish coat: S-W Pro-Mar 400 Latex Semi-Gloss Enamel B31W401.
 - 2. Ceilings: Interior latex semi-gloss enamel finish: 1 finish coat over primer with total dry film thickness not less than 1.3 mils.
 - a. Primer: S-W Pro-Mar 400 Latex Wall Primer B31W401.
 - b. Finish coat: S-W Pro-Mar 400 Latex Semi-Gloss Enamel B31W401.
- D. Ferrous metal, painted:
 - 1. Interior alkyd egg-shell enamel finish: 1 finish coat over primer with total dry film thickness not less than 4.8 mils.
 - a. Primer: S-W Kem Kromik Metal Primer B50N2/W1.
 - b. Finish coat: S-W Pro-Mar 200 Alkyd Eg-Shel Enamel B33 Series.
- E. Zinc-coated metal, painted:
 - 1. Interior alkyd egg-shell enamel finish: 1 finish coat over primer with total dry film thickness not less than 3.8 mils.
 - a. Primer: S-W Galvite B50W3.
 - b. Finish coat: S-W Pro-Mar 200 Alkyd Eg-Shel Enamel B33 Series.
- F. Wood, painted:
 - 1. Interior latex semi-gloss enamel finish: 1 finish coat over undercoat with total dry film thickness not less than 1.3 mils per coat.

- a. Primer: S-W Pro-Mar 400 Latex Wall Primer B31W401.
- b. Finish coat: S-W Pro-Mar 400 Latex Semi-Gloss Enamel B31W401.

END OF SECTION 09900

This page was intentionally left blank for duplex printing.

SECTION 11450

RESIDENTIAL EQUIPMENT

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide residential equipment as shown and specified. Work includes:
 - 1. Dishwashers.
 - 2. Range hoods.
 - 3. Disposals.
 - 4. Acrylic window well covers.
 - 5. Work includes loading, delivery, unpacking, installation and testing owner supplied gas ranges and refrigerators for proper functioning in all 30 family units. Gas ranges and refrigerators are stored in Housing Management designated Grand Forks AFB warehouse.
- B. Related Sections:
 - 1. Section 12370 – Residential Casework.
 - 2. Division 02070 – Selective Demolition “.
 - 3. Division 15 "Plumbing and Mechanical" for mechanical requirements.
 - 4. Division 16 "Electrical" for electrical requirements.

1.02 SUBMITTALS

- A. Submit manufacturer's specifications and installation instructions for each type of residential equipment, including data indicating compliance with requirements. Submit operating and maintenance instructions for each item of residential equipment.
- B. Submit schedule of residential equipment, using same room designation shown on drawings.

1.03 QUALITY ASSURANCE

- A. Certification Labels: Provide residential equipment which complies with standards and bears certification labels as follows:
 - 1. Energy Ratings: Provide energy guide labels with energy cost analysis (annual operating costs) and efficiency information as required by Federal Trade Commission.
 - 2. UL Standards: Provide residential equipment with UL labels.
 - 3. ANSI Standards: Provide gas-burning residential equipment with American Gas Association (AGA) seal of approval, complying with ANSI Z21-Series.
- B. Provide products of one manufacturer for the entire project.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's undamaged protective containers.
- B. Contractor will pick up all products stored at a Housing Management designated Grand Forks AFB warehouse. Location will be determined at the start of the project.

1.05 WARRANTY

- A. Submit manufacturers standard written warranty for each type of residential equipment required.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Dishwashers and Range Hoods: General Electric and Hotpoint (specified) or an approved equal.

2.02 RESIDENTIAL EQUIPMENT

- A. Dishwashers: Hotpoint or equal.
 - 1. Model: Hotpoint HDA3230Z07WW.
 - 2. Dimensions: 24 inches W x 25 inches D x 34 inches H.
 - 3. Color: White on white, black control panel.
 - 4. Special Features:
 - a. 3 wash levels.
 - b. Deluxe upper and lower racks.
 - 5. Quantity: 1 for each Living Unit.
 - 6. Required Accessories: Provide equipment complete with all necessary accessories including anchor bolts, leveling legs, overload protection devices, and utility connection devices including drain hose.
 - a. Pigtail Cord: Provide attached 3'-0" long pigtail cord to each dishwasher.
 - 7.
- B. Range Hood: General Electric or equal.
 - 1. Model: General Electric JV356V.
 - 2. Dimensions: 29-7/8 inches W x 19-3/4 inches D x 7 inches H.
 - 3. Exhaust: Top or back-mounted rectangular opening with damper.
 - 4. Color: White on white (WW).
 - 5. Fan: 250 CFM at 5.5 sones; variable-speed.
 - 6. Permanent washable filter, top exhaust, and eye level controls, 2 cooktop lights.
 - 7. Metal: 0.021 inch steel with powder coat baked enamel finish.
- C. Disposer:Continuous Feed Type: In-Sink-Erator Division or equal.

1. Emerson Electric Model E20PC.
 2. 1/2 horsepower motor, 1725 rpm, overload protection, wall-switch operated; corrosion-resistant construction, with quick-mounting feature, stainless steel or white plastic sink flange, cushioned suspension, and stainless steel grinding chamber; jam-resistant cutting/shredding mechanism featuring swivel-mounted impellers on turntable, cast tool steel grinding ring, and cutlery steel undercutter blade; insulating housing for grinding chamber; anti-splash guard and combination cover/stopper.
 - a. Accessories/Options:
 - b. Pigtail Cord: Provide attached 3'-0" long pigtail cord to each disposer.
- D. Acrylic Window Well Covers:
1. Factory fabricated units consisting of manufacturer's standard molded design.
 2. Material: Transparent polycarbonate (acrylic) cover with integral attachment flanges.
 3. Temperature, impact, breakage and UV resistant.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Comply with manufacturer's instructions and recommendations.
- B. Built-In Equipment: Securely anchor units to supporting cabinetry or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Utilities: Refer to Division 15 and 16 for plumbing and electrical requirements.

3.02 ADJUST AND CLEAN

- A. Testing: test each item of residential equipment to verify proper operation. make necessary adjustments.
- B. Accessories; Verify that accessory items required have been furnished and installed.
- C. Cleaning: Remove packing material from residential equipment items and leave units in clean condition, ready for operation.

END OF SECTION 11450

This page was intentionally left blank for duplex printing.

SECTION 12370

RESIDENTIAL CASEWORK

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide residential casework as shown and specified. Work includes:
 - 1. Factory fabricated and finished wood cabinets for kitchen areas.
 - 2. Countertops.
 - 3. There will be no work required in the bathrooms.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry: Wood blocking in walls.

1.02 SUBMITTALS

- A. Submit the following:
 - 1. Submit product data for each casework type specified.
 - 2. Submit shop drawings for casework showing location and size, accessories, materials, finishes, and filler panels. Include fully dimensioned plans, elevations, and anchorage details to countertop and walls.
 - 3. Submit shop drawings for countertops showing sizes, shapes, edge and backsplash profiles, cutouts for plumbing fixtures, and methods of joining.
 - 4. Submit samples for initial section purposes in the form of manufacturer's color charts showing full range of colors, textures, and patterns available for each type of material indicated or exposed to view.
 - 5. Submit a sample base cabinet and wall cabinet for each type of cabinet specified for verification purposes. Also include the following:
 - a. Submit 12 inch-square samples of solid wood with transparent finish for each finish specified, showing the full range of expected variations in color, graining, and texture in the products to be furnished.
 - b. Submit 12 inch-square samples of veneered plywood with transparent finish for each finish specified, showing the full range of expected variations in color, graining, and texture in the products to be furnished.
 - c. Submit 12 inch-square samples of plastic laminate for countertops for each color specified.
 - d. Submit two units of each type of exposed hardware.
 - 6. Submit product certificates signed by the manufacturer certifying that materials furnished comply with specified requirements.

1.03 QUALITY ASSURANCE

- A. Kitchen Casework: Comply with ANSI/NKCA A161.1.
 - 1. NKCA Certification: Provide kitchen casework with National Kitchen Cabinet Association (NKCA) "Certified Cabinet" seal affixed in a semi-exposed location of each unit, evidencing compliance with above standard.
- B. Single-Source Responsibility: Obtain kitchen casework from one source from a single manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver casework as a factory-assembled unit, packaged individually, and shipped each in its own carton.

1.05 PROJECT CONDITIONS

- A. Verify casework dimensions by field measurements. Verify kitchen casework can be installed in compliance with the original design and referenced standards.
- B. Comply with manufacturer's requirements for temperature and humidity conditions during storage and installation.

1.06 WARRANTY

- A. Submit a written warranty, executed by the manufacturer, agreeing to repair or replace cabinetry that fails in materials or workmanship within the specified warranty period. This warranty shall be in addition to, and not a limitation of other rights the Government may have against the Contractor under the Contract Documents.
 - 1. Submit manufacturer's material and workmanship warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers:
 - 1. Casework: Kraft Maid Cabinetry, Inc., Middlefield, Ohio, telephone (216) 632-5333 or an approved equal.
 - 2. Plastic Laminate for Countertops: Wilsonart, Formica, Nevamar, or an approved equal.

2.02 MATERIALS, GENERAL

- A. Hardwood Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better.

- B. Particleboard-Core Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better.
- C. Solid Wood: Clear, dry, sound, and free of defects selected from First Grade lumber as defined by National Hardwood Lumber Association (NHLA).
- D. Hardboard: ANSI A135.4, Class 1, tempered.
- E. Plastic Laminate: NEMA LD-3; in thickness indicated. Provide color-through product. For color, refer to Interior Color Schedule on drawings.
- F. Thermoset Decorative Panels: Comply with ALA-1988 and NEMA LD-3 for GP20; melamine or polyester.

2.03 WOOD CASEWORK STYLES, SPECIES, AND DESIGN

- A. Cabinet: KraftMaid Traditional Cabinets"
 - 1. Door Style: "Lexington/Amhurst W11" – Full overlay door design with single or double side-by-side maple veneer recessed panels.
 - 2. Wood Species: Oak
 - 3. Wood Finish: Honey Spice.
 - 4. Door Design: One-piece drawer front, solid oak frame with a solid 9/16-inch raised panel door.

2.04 WOOD CASEWORK FABRICATION

- A. Fabrication: Provide manufacturer's standard construction specifications for wood cabinets of style, wood species and design indicated, with manufacturer's standard finish surfacing, meeting or exceeding the following specified performance standards:
- B. Cabinets shall be all plywood construction (APC).
 - 1. Side panels shall be 1/2-inch thick plywood with birch veneer interior and exterior, rabbeted to accept tops, backs, and bottoms. Provide true oak veneer panel at all exposed ends.
 - 2. Cabinet tops and floors shall be 1/2-inch thick plywood with birch veneer interior and exterior. Reinforce with 1/2-inch plywood one-beam supports.
 - 3. Wall backs shall be 3/16 inch thick plywood with birch veneer.
 - 4. Provide 1/2-inch thick solid wood, concealed hanging rails at top and bottom of wall cabinets.
 - 5. Provide 3/4 inch thick solid wood, concealed hanging rails at top of base cabinets.
 - 6. Provide true oak veneer panel at exposed cabinet backs.
 - 7. Cabinet base and tall backs shall be 3/8 inch thick plywood with birch veneer.
 - 8. Toe kicks shall be 1/2 inch thick plywood with birch veneer.
 - 9. Face frames shall be solid oak, 3/4 inch x 1-5/8 inch wide, double doweled and glued.
 - 10. Interiors including drawers shall be sealed and top coated.
- C. Doors shall be solid 3/4 inch x 2-5/16 inch (min) oak stiles and rails with mortise and tenon joints with solid 9/16-inch raised panel centers. Provide doors with door bumpers.
- D. Drawers shall be fabricated with full depth, four-sided drawer.

1. Drawer fronts shall be 3/4-inch thick solid wood.
 2. Drawer boxes shall have 3/4-inch solid hardwood sides and backs, and a 3/16-inch plywood captured bottom.
 3. Drawer suspension shall be minimum capacity of 75 lb. with twin track, under-mounted drawer-glide suspension with cylindrical rollers. Provide self-closing feature, positive stop, and self-adjusting guide.
 4. Drawer construction shall be furniture dovetail.
- E. Shelves shall be 3/4-inch thick wood with birch veneer, sealed and top coated.
1. All wall cabinets shelves shall be full depth and adjustable. Provide one shelf in 24-inch high (or greater) cabinets and two shelves in 30-inch high cabinets.
 2. All base cabinets shall have 3/4-inch depth, adjustable shelf with twelve adjustment positions. Shelves shall be supported at the sides and back.
 3. All shelves shall support 15 lb./sq. foot without sagging or bending. Additional center shelf supports shall be provided on all 30 inch or greater width shelves.
- F. Hardware:
1. Provide manufacturer's standard units on all doors and drawers complying with ANSI A156.9, of type, material, size, and finish as selected from manufacturer's standard choices.
 2. All doors shall be mounted on 1/2-inch overlay concealed hinge. All hinges shall have a lifetime warranty.
 3. All doors and drawers shall have decorative brass hardware in kitchens, design as selected from the full range of manufacturer's standard products.
 - a. Wire Pull design: #205 (brass).

2.05 WOOD CASEWORK FINISHES

- A. Finish Honey Spice on oak (Kraft Maid).
- B. Factory Finishing: Provide wood casework factory finished, with manufacturer's progressive step finishing process, culminating with a catalyzed conversion varnish finish. Provide finishing process equal to the following:
1. Sanding #120 to #220 grit sandpaper in progressive sanding process.
 2. Vacuum of all surfaces.
 3. Application of equalizer stains to balance base color of the wood.
 4. Application of toner.
 5. Application of penetrating stain.
 6. Stained surfaces handrubbed and wiped clean.
 7. Air-drying
 8. Application of high-solids wood sealer.
 9. Wood is cured in high temperature oven.
 10. Surfaces are hand-sanded.
 11. Application of manufacturer's catalyzed topcoat.
 12. Topcoated product is cured in oven.
 13. Hand-polish.

2.06 COUNTERTOPS, PLASTIC LAMINATE

- A. General: Comply with ANSI/DLPA A161.2 – 1978 (R 1987).
- B. Type of Top: High-pressure decorative laminate complying with the following:
 - 1. Grade: GP-40, post-forming grade, 0.050 inch nominal thickness. Color as scheduled.
- C. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- D. Core Material: Medium-density particleboard.
- E. Configuration: Provide countertops with the following front style, cove, and backsplash style as follows:
 - 1. Front Style: Drip-less (no drip).
 - 2. Backsplash and Endsplash Style: Style "A" per DLPA A161.2; coved with scribe.
 - 3. Cove: Cove molding.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install casework with no variations in flushness of adjoining surfaces, using concealed shims. Where casework abuts other finished work, scribe, and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.
- B. Install casework without distortion so that doors and drawers fit openings properly and are aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessories as indicated.
- C. Install casework and countertop level and plumb to a tolerance of 1/8 inch in 8 feet.
- D. Apply wood sealer to edge of sink cutouts, exposed countertop edge above dishwasher, and to area of backsplash behind sink.
- E. Fasten casework units to adjacent units and into structural support members of wall construction with screws and washer head or washer.
- F. Fasten unit of casework to adjacent unit and into structural support members of wall construction with screws and washer head or washer.
- G. Fasten plastic laminate countertops by screwing through corner blocks in base units into underside of countertop. Spline and glue joints in countertops and provide concealed mechanical clamping of joint.

3.02 ADJUST AND CLEAN

- A. Adjust hardware to center doors and drawer in openings and lubricate to provide unencumbered operation.
- B. Clean casework on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

CN01 RPR MFH HOLLY PH1 (30UN)
GRAND FORKS AFB ND

SOLICITATION NO. DACA45-02-B-0005

END OF SECTION 12370

SECTION 12492

VERTICAL LOUVER BLINDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following types of vertical louver blinds and accessories:
 - 1. With PVC vanes at all exterior sliding patio doors locations (30 family units total).
- B. Related Sections include the following:
 - 1. Division 6 Section "Miscellaneous Carpentry" for wood blocking and grounds for mounting vertical louver blinds and accessories.
 - 2. Division 12 Section "Horizontal Louver Blinds" for horizontal blinds.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.
- B. Samples for Initial Selection: For each colored component of each type of vertical louver blind indicated.
 - 1. Include similar Samples of accessories involving color selection.
- C. Samples for Verification: For the following products, prepared on Samples from the same material to be used for the Work.
 - 1. Louver Vane: Not less than 12 inches (300 mm) long.
 - 2. Vertical Louver Blind: Full-size unit, not less than 16 inches (400 mm) wide by 24 inches (600 mm) long.
 - 3. Valance: Full-size unit, not less than 12 inches (300 mm) wide.
 - 4. Cornice: Full-size unit, not less than 12 inches (300 mm) long.
- D. Window Treatment Schedule: Include vertical louver blinds in schedule using same room designations indicated on Drawings.

- E. Product Certificates: For each type of vertical louver blind product, signed by product manufacturer.
- F. Product Test Reports: For each type of vertical louver blind product.
- G. Maintenance Data: For vertical louver blinds to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining vertical louver blinds and finishes.
 - 2. Precautions about cleaning materials and methods that could be detrimental to finishes and performance.
 - 3. Operating hardware.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain vertical louver blinds through one source from a single manufacturer.
- B. Fire-Test-Response Characteristics: Provide vertical louver blinds with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Resistance Ratings: Passes NFPA 701.
- C. Corded Window Covering Product Standard: Provide vertical louver blinds complying with WCMA A 100.1.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver blinds in factory packages, marked with manufacturer and product name, and location of installation using same room designations indicated on Drawings and in a window treatment schedule.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install vertical louver blinds until construction and wet and dirty finish work in spaces, including painting, is complete and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where vertical louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operable glazed units' operation hardware throughout the entire operating range. Notify Architect of discrepancies. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Vertical Louver Blinds, PVC Vanes:
 - a. Hunter Douglas Window Fashions.
 - b. Levolor Contract; a Newell Company; LouverDrape.
 - c. Springs Window Fashions Division, Inc.; Graber.

2.2 VERTICAL LOUVER BLINDS FABRICATION

- A. Product Description: Vertical louver blind consisting of equally spaced, synchronized louver vanes and rail system with self-aligning carrier mechanisms, carriers, traverse and vane directional mechanisms and controls, and installation hardware.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
 - 1. Louver Directional and Traversing Control Mechanisms: With permanently lubricated moving parts.
- C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Blind Units Installed between (Inside) Jambs: Width equal to 1/4 inch (6 mm) per side or 1/2 inch (12 mm) total less than jamb-to-jamb dimension of opening in which each blind is installed. Length equal to 1/4 inch (6 mm), plus or minus 1/8 inch (3 mm), less than head-to-sill dimension of opening in which each blind is installed.
 - 2. Blind Units Installed Outside Jambs: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- D. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, valance, and operating hardware, and for hardware position and blind mounting method indicated.
- E. Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to blind hardware and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.
- F. Color-Coated Finish: For metal components exposed to view, unless anodized or plated finish is indicated. Apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness.
- G. Component Color: Provide cords and exposed-to-view metal and plastic matching or coordinating with vane color, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 VERTICAL LOUVER BLIND INSTALLATION

- A. Install blinds level and plumb and aligned with adjacent units according to manufacturer's written instructions, and located so exterior louver edges in any position are not closer than 2 inches to interior face of glass. Install intermediate support as required to prevent deflection in headrail. Allow clearances between adjacent blinds and for operating glazed opening's operation hardware, if any.
- B. Flush Mounted: Install blinds with louver edges flush with finish face of opening when vanes are tilted open.
- C. Jamb Mounted: Install headrail flush with face of opening jamb and head.
- D. Head Mounted: Install headrail on face of opening head.

3.3 ADJUSTING

- A. Adjust vertical louver blinds to operate smoothly, easily, safely and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean blind surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that vertical louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged blinds that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 12492

SECTION 12510
WINDOW COVERINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Horizontal slat louver blinds and hardware in the following locations:
 - 1. All exterior window openings.

1.02 RELATED SECTIONS

- A. Section 09260 – Gypsum Board Systems.

1.03 SUBMITTALS

- A. Submit shop drawings indicating opening sizes, tolerances required, installation of blinds at window opening, method of attachment, clearances, and operation.
- B. Submit manufacturer's product data and installation instruction under provision of Section 01300 – Submittals.
- C. Submit actual sample of window blind specified herein. Samples may be used in the project.
- D. Submit manufacturer's full range of blind colors for selection by the Contracting Officer.

1.04 QUALITY ASSURANCE

- A. Provide horizontal louver blinds which are complete assemblies produced by one manufacturer including hardware, accessory items, mounting brackets, and fasteners. Blinds must be lead-free.
- B. Furnish materials in colors as selected from manufacturer's standard colors.
- C. Manufacturer shall be company specializing in the manufacture of the products specified with five years experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver blinds wrapped and coated in a manner to prevent damage to components or marring of surfaces.
- B. Store in a clean, dry area, laid flat and blocked off ground to prevent sagging, twisting or warping.

1.06 PROJECT CONDITIONS

- A. Check openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the Work.

1.07 WARRANTY

- A. Provide manufacturer's and installer's 1 year warranty for all defects on materials or factory workmanship.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Louver Blinds: (Standard) Levolor Corporation of Sunnyvale, CA, or equal products of Bali Classics mini blinds by Springs Window Fashions Division, Inc. (Bali-Graber) or Hunter Douglas, Inc., Upper Saddle River, NJ.

2.02 MATERIALS – LOUVER BLINDS

- A. Louver Slats: Nominal one-inch wide cold-rolled aluminum horizontal slats, radiused slat corners.
 - 1. Color: As scheduled on the drawings.
 - 2. Provide 14.2 slats per vertical foot.
 - 3. Slats shall be nominally .0063 inches thick prior to coating.
- B. Slat Support (Ladders): Braided polyester yarn. Rungs of not less than two crossed cables inter-braided with vertical components.
- C. Head Channel: Prefinished, 0.024 inch thick phosphate treated steel with vinyl primer and polyester-baked enamel finish coat. Channel internally fitted with hardware, pulleys and bearing for blind operation.
- D. Lift Cord: Braided high strength polyester fiber cord fabric; continuous loop.
- E. Control Wand: Transparent, extruded hollow plastic, round cross section, 5/16 inch diameter, removable type, length of window opening height less 12 inches.
- F. Head Support Bracket: Prefinished formed steel, minimum 0.025 inch thick overhead head rail housing attachment, including intermediate brackets as required by manufacturer for support of blinds, finish to match head channel. Provide extension brackets to clear depth of window casings.
- G. Accessory Hardware: Type recommended by blind manufacturer.

- H. Light blocking Blinds: Furnish as scheduled in this section.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine openings where shades and blinds will be installed prior to beginning installation. Verify that openings are ready to receive the work and that critical dimensions are correct and surface conditions acceptable.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected and finishing operations, including painting are completed.

3.02 INSTALLATION

- A. Install shades in accordance with manufacturer's instructions, level and plumb. Install all blinds inside mount; within the window casing.
- B. Install mounting brackets with at least two fasteners per bracket. Secure in place with flush countersunk fasteners.
- C. Provide blinds at all window openings.

3.03 TOLERANCES

- A. Maximum variation of gap at window opening perimeter: 1/4 inch.
- B. Maximum offset from level: 1/8 inch.

3.04 ADJUSTING

- A. Adjust blinds for smooth operation.

3.05 CLEANING

- A. Upon completing installation clean shades and blinds in accordance with manufacturer's recommendations.

3.06 SCHEDULE

- A. Light blocking window blinds: Provide manufacturer's light blocking blinds in all bedroom windows, standard blinds elsewhere.

END OF SECTION 12510

SECTION 15050

BASIC MECHANICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and the Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following basic mechanical materials and methods to complement other Division 15 Sections.
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Concrete equipment base construction requirements.
 - 3. Installation requirements common to equipment specification Sections.
 - 4. Cutting and patching.
 - 5. Touchup painting and finishing.
- B. Pipe and pipe fitting materials are specified in piping system Sections.

1.03 DEFINITIONS

- A. Pipe, pipe fittings, and piping include tube, tube fittings, and tubing.
- B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
- C. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- D. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- E. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
- F. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.04 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

1.05 QUALITY ASSURANCE

- A. Qualify welding processes and operators for structural steel according to AWS D1.1 "Structural Welding Code—Steel."
- B. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code," Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions of ASME B31 Series "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for the welding processes involved and that certification is current.
- C. Equipment Selection: Equipment of greater or larger power, dimensions, capacities, and ratings may be furnished provided such proposed equipment is approved in writing and connecting mechanical and electrical services, circuit breakers, conduit, motors, bases, and equipment spaces are increased. No additional costs will be approved for these increases, if larger equipment is approved. If minimum energy ratings or efficiencies of the equipment are specified, the equipment must meet the design requirements and commissioning requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end-caps. Maintain end-caps through shipping, storage, and handling to prevent pipe-end damage and prevent entrance of dirt, debris, and moisture.
- B. Protect stored pipes and tubes from moisture and dirt. Elevate above grade. When stored inside, do not exceed structural capacity of the floor.
- C. Protect flanges, fittings, and piping specialties from moisture and dirt.
- D. Protect stored plastic pipes from direct sunlight. Support to prevent sagging and bending.

1.07 SEQUENCING AND SCHEDULING

- A. Coordinate mechanical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for mechanical installations.
- C. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

- D. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Coordinate installation of large equipment requiring positioning prior to closing in the building.
- E. Coordinate connection of electrical services.
- F. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

PART 2 – PRODUCTS

2.01 PIPE AND PIPE FITTINGS

- A. Refer to individual piping system specification Sections for pipe and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.02 JOINING MATERIALS

- A. Refer to individual piping system specification Sections in Division 15 for special joining materials not listed below.
- B. Solder Filler Metal: ASTM B 32.
 - 1. Alloy Sn95 or Alloy Sn94: Tin (approximately 95 percent) and silver (approximately 5 percent), having 0.10 percent lead content.
 - 2. Alloy E: Tin (approximately 95 percent) and copper (approximately 5 percent), having 0.10 percent maximum lead content.
 - 3. Alloy HA: Tin-antimony-silver-copper-zinc, having 0.10 percent maximum lead content.
 - 4. Alloy HB: Tin-antimony-silver-copper-nickel, having 0.10 percent maximum lead content.
 - 5. Alloy Sb5: Tin (95 percent) and antimony (5 percent), having 0.20 percent maximum lead content.
- C. Brazing Filler Metals: AWS A5.8.
 - 1. BCuP Series: Copper-phosphorus alloys.
 - 2. BAg1: Silver alloy.
- D. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- E. Solvent Cements: Manufacturer's standard solvents and primers complying with the following:
 - 1. Poly(Vinyl Chloride) (PVC): ASTM D 2564.
- F. Plastic Pipe Seals: ASTM F 477, elastomeric gasket.

2.03 PIPING SPECIALTIES

- A. Escutcheons: Manufactured wall, ceiling, and floor plates; deep-pattern type where required to conceal protruding fittings and sleeves.
 - 1. Inside Diameter: Closely fit around pipe, tube, and insulation.
 - 2. Outside Diameter: Completely cover opening.
 - 3. Stamped Steel: One-piece, with set-screw and chrome-plated finish.
 - 4. Stamped Steel: Split plate, with concealed hinge, spring clips, and chrome-plated finish.
- B. Dielectric Fittings: Assembly or fitting having insulating material isolating joined dissimilar metals to prevent galvanic action and stop corrosion.
 - 1. Description: Combination of copper alloy and ferrous; threaded, solder, plain, and weld neck end types and matching piping system materials.
 - 2. Insulating Material: Suitable for system fluid, pressure, and temperature.
 - 3. Dielectric Unions: Factory-fabricated, union assembly for 250-psig (1725-kPa) minimum working pressure at a 180 deg F (82 deg C) temperature.
 - 4. Dielectric Nipples: Electroplated steel nipple, having inert and noncorrosive thermoplastic lining, with combination of plain, threaded, or grooved end types and 300-psig (2070-kPa) working pressure at 225 deg F (107 deg C) temperature.
- C. Mechanical Sleeve Seals: Modular, watertight mechanical type. Components include interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve. Connecting bolts and pressure plates cause rubber sealing elements to expand when tightened.
- D. Sleeves: The following materials are for wall and slab penetrations:
 - 1. Steel Sheet-Metal: 24-gage (0.70mm) or heavier galvanized sheet metal, round tube closed with welded longitudinal joint.
 - 2. Steel Pipe: ASTM A 53, Type E, Grade A, Schedule 40, galvanized, plain ends.
 - 3. Cast-Iron: Cast or fabricated wall pipe equivalent to ductile-iron pressure pipe, having plain ends and integral water stop, except where other features are specified.
 - 4. PVC Plastic: Manufactured, permanent, with nailing flange for attaching to wooden forms.
 - 5. PVC Plastic Pipe: ASTM D 1785, Schedule 40.
 - 6. PE Plastic: Manufactured, reusable, tapered, cup-shaped, smooth outer surface, with nailing flange for attaching to wooden forms.

PART 3 – EXECUTION

3.01 PIPING SYSTEMS—COMMON REQUIREMENTS

- A. General: Install piping as described below, except where system Sections specify otherwise. Individual piping system specification Sections in Division 15 specify piping installation requirements unique to the piping system.

- B. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated, except where deviations to layout are approved on coordination drawings.
- C. Install piping at indicated slope.
- D. Install components having pressure rating equal to or greater than system operating pressure.
- E. Install piping in concealed interior and exterior locations, except in equipment rooms and service areas.
- F. Install piping free of sags and bends.
- G. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- H. Install piping tight to slabs, beams, joists, columns, walls, and other building elements
- I. Install piping to allow application of insulation plus 1-inch (25-mm) clearance around insulation.
- J. Locate groups of pipes parallel to each other, spaced to permit valve servicing.
- K. Install fittings for changes in direction and branch connections.
- L. Install couplings according to manufacturer's printed instructions.
- M. Install pipe escutcheons for pipe penetrations of concrete and masonry walls, wall board partitions, and suspended ceilings according to the following:
 - 1. Uninsulated Piping Wall Escutcheons: Stamped-steel with set-screw.
 - 2. Insulated Piping: Stamped-steel with concealed hinge, spring clips, and chrome-plated finish.
- N. Sleeves are not required for core drilled holes.
- O. Permanent sleeves are not required for holes formed by PE plastic (removable) sleeves.
- P. Install sleeves for pipes passing through concrete and masonry walls, concrete floor, and where indicated.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level.
 - 2. Build sleeves into new walls and slabs as work progresses.
 - 3. Install large enough sleeves to provide 1/4-inch (6-mm) annular clear space between sleeve and pipe or pipe insulation. Use the following sleeve materials:
 - a. PVC Pipe Sleeves: For pipes smaller than 6 inches (150 mm).
 - b. Steel Pipe Sleeves: For pipes smaller than 6 inches (150 mm).

4. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants specified in Division 7 Section "Joint Sealers."
- Q. Above Grade, Exterior Wall, Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeve for 1-inch (25-mm) annular clear space between pipe and sleeve for installation of mechanical seals.
1. Install steel pipe for sleeves smaller than 6 inches (150 mm).
 2. Install cast-iron wall pipes for sleeves 6 inches (150 mm) and larger.
 3. Assemble and install mechanical seals according to manufacturer's printed instructions.
- R. Verify final equipment locations for roughing in.
- S. Refer to equipment specifications in other Sections for roughing-in requirements.
- T. Piping Joint Construction: Join pipe and fittings as follows and as specifically required in individual piping system Sections.
1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 3. Soldered Joints: Construct joints according to AWS "Soldering Manual," Chapter 22 "The Soldering of Pipe and Tube."
 4. Brazed Joints: Construct joints according to AWS "Brazing Manual" in the "Pipe and Tube" chapter.
 5. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full inside diameter. Join pipe fittings and valves as follows:
 - a. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 - b. Apply appropriate tape or thread compound to external pipe threads (except where dry seal threading is specified).
 - c. Align threads at point of assembly.
 - d. Tighten joint with wrench. Apply wrench to valve end into which pipe is being threaded.
 - e. Damaged Threads: Do not use pipe or pipe fittings having threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 6. Welded Joints: Construct joints according to AWS D10.12 "Recommended Practices and Procedures for Welding Low Carbon Steel Pipe" using qualified processes and welding operators according to the "Quality Assurance" Article.
 7. Plastic Pipe and Fitting Solvent-Cement Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join pipe and fittings according to the following standards:
 - a. Comply with ASTM F 402 for safe handling of solvent-cement and primers.
 - b. Poly(Vinyl Chloride) (PVC) Non-Pressure Application: ASTM D 2855.

- U. Piping Connections: Except as otherwise indicated, make piping connections as specified below.
 - 1. Install unions in piping 2 inches (50 mm) and smaller adjacent to each valve and at final connection to each piece of equipment having a 2-inch (50-mm) or smaller threaded pipe connection.
 - 2. Wet Piping Systems (Water and Steam): Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.02 EQUIPMENT INSTALLATION—COMMON REQUIREMENTS

- A. Install equipment to provide the maximum possible headroom where mounting heights are not indicated.
- B. Install equipment according to approved submittal data. Portions of the Work are shown only in diagrammatic form. Refer conflicts to the Contracting Officer.
- C. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, except where otherwise indicated.
- D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location.
- E. Install equipment giving right-of-way to piping systems installed at a required slope.

3.03 PAINTING AND FINISHING

- A. Refer to Division 9 Section "Painting" for field painting requirements.
- B. Damage and Touch Up: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.04 CONCRETE BASES

- A. Construct concrete equipment bases of dimensions indicated, but not less than 4 inches (100 mm) larger than supported unit in both directions. Follow supported equipment manufacturer's setting templates for anchor bolt and tie locations. Use 3000-psi (20.70-MPa), 28-day compressive strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

3.05 CUTTING AND PATCHING

- A. Do not cut or damage work of other trades without prior approval of that trade and the Contracting Officer.
- B. Repair cut surfaces to match adjacent surfaces.

END OF SECTION

SECTION 15100

VALVES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes general duty valves common to several mechanical piping systems.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Special purpose valves are specified in Division 15 piping system Sections.

1.03 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each valve type. Include body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions. Include list indicating valve and its application.
- C. Maintenance data for valves to include in the operation and maintenance manual specified in Division 1. Include detailed manufacturer's instructions on adjusting, servicing, disassembling, and repairing.

1.04 QUALITY ASSURANCE

- A. MSS Compliance: Comply with the various MSS Standard Practice documents referenced.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads.
 - 3. Set ball valves open to minimize exposure of functional surfaces.
 - 4. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ball Valves:
 - a. Conbraco Industries, Inc.; Apollo Division.
 - b. Hammond Valve Corporation.
 - c. Milwaukee Valve Company, Inc.
 - d. NIBCO Inc.
 - 2. Swing Check Valves:
 - a. Hammond Valve Corporation.
 - b. Milwaukee Valve Company, Inc.
 - c. NIBCO Inc.
 - d. Powell: Wm. Powell Company (The).

2.02 BASIC, COMMON FEATURES

- A. Pressure and Temperature Ratings: As indicated in the "Application Schedule" of Part 3 of this Section and as required to suit system pressures and temperatures.
- B. Sizes: Same size as upstream pipe, unless otherwise indicated.
- C. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation.

- D. Threads: ASME B1.20.1.

2.03 BALL VALVES

- A. Ball Valves, 4 Inches (DN100) and Smaller: MSS SP-110, Class 150, 600-psi (4140-kPa) CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch (DN15) valves and smaller and conventional port for 3/4-inch (DN20) valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded end connections and:
 - 1. Operator: Vinyl-covered steel lever handle.
 - 2. Stem Extension: For valves installed in insulated piping.

2.04 SWING CHECK VALVES

- A. Swing Check Valves, 2-1/2 Inches (DN65) and Smaller: MSS SP-80; Class 150, 300-psi (2070-kPa) CWP; horizontal swing, Y-pattern, ASTM B 62 cast-bronze body and cap, rotating bronze disc with rubber seat or composition seat, threaded or soldered end connections:

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance of valves. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- C. Operate valves from fully open to fully closed positions.
- D. Examine threads on valve and mating pipe for form and cleanliness.
- E. Do not attempt to repair defective valves; replace with new valves.

3.02 INSTALLATION

- A. Install valves as indicated, according to manufacturer's written instructions.
- B. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties.

- C. Install valves with unions at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.
- D. Locate valves for easy access and provide separate support where necessary.
- E. Install valves in horizontal piping with stem at or above the center of the pipe.
- F. Installation of Check Valves: Install swing check valves in horizontal position with hinge pin level.

3.03 THREADED CONNECTIONS

- A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.
- B. Align threads at point of assembly.
- C. Apply appropriate tape or thread compound to the external pipe threads, except where dry seal threading is specified.
- D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.04 VALVE END SELECTION

- A. All valves to be threaded end.

3.05 APPLICATION SCHEDULE

- A. Domestic Water Systems: Use the following valve types:
 - 1. Ball Valves: Class 150, 600-psi (4140-kPa) CWP, with stem extension as required.
 - 2. Bronze Swing Check: Class 125, with rubber seat.

3.06 ADJUSTING

- A. Adjust or replace packing after piping systems have been tested and put into service, but before final adjusting and balancing. Replace valves if leak persists.

END OF SECTION

SECTION 15145

HANGERS AND SUPPORTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawing and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes hangers and supports for mechanical systems piping and equipment.

1.03 DEFINITIONS

- A. Terminology used in this Section is defined in MSS SP-90.

1.04 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Submit product data for each type of hanger and support.

PART 2 – PRODUCTS

2.01 MANUFACTURED UNITS

- A. Hangers, Supports, and Components: Factory-fabricated according to MSS SP-58.
 - 1. Pipe attachments include electrolytic protection where attachments are in direct contact with copper tubing.
 - a. Nonmetallic coating.
 - b. Solid copper material.

PART 3 – EXECUTION

3.01 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger requirements are specified in the Section specifying the equipment and systems.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping specification Sections.

3.02 HANGER AND SUPPORT INSTALLATION

- A. General: Comply with MSS SP-69 and SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Arrange for grouping of parallel runs of horizontal piping supported together on field-fabricated, heavy-duty trapeze hangers where possible.
- C. Install supports with maximum spacings complying with MSS SP-69.
- D. Where pipes of various sizes are supported together by trapeze hangers, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
- E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- F. Install hangers and supports to allow controlled movement of piping systems.
- G. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so that maximum pipe deflections allowed by ASME B31.9 "Building Services Piping" is not exceeded.
- I. Insulated Piping: Comply with the following installation requirements.
 - 1. Clamps: Attach clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.
 - 2. Shields: Install MSS Type 40, protective shields on piping with vapor barrier. Shields span an arc of 180 degrees (3.1 rad) and have dimensions in inches (mm) not less than the following:

NPS (Inches)	LENGTH (Inches)	THICKNESS (Inches)
1/4 to 3-1/2	12	0.048

PIPE SIZE (DN)	LENGTH (mm)	THICKNESS (mm)
8 to 90	300	1.22

3. Thermal-Hanger Shields: Install with insulation of same thickness as piping.

3.03 ADJUSTING

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15170

MOTORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes basic requirements for factory-installed and field-installed motors.
- B. Related Sections include the following:
 - 1. Division 15 Sections for application of motors and reference to specific motor requirements for motor-driven equipment.

1.03 SUBMITTALS

- A. Product Data: Show nameplate data and ratings; characteristics; mounting arrangements; size and location of winding termination lugs, conduit entry, and grounding lug; and coatings.

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Listing and Labeling: Provide motors specified in this Section that are listed and labeled.
 - 1. Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.

PART 2 – PRODUCTS

2.01 BASIC MOTOR REQUIREMENTS

- A. Basic requirements apply to mechanical equipment motors, unless otherwise indicated.
- B. Motors Smaller than 1/2 HP: Single phase.
- C. Frequency Rating: 60 Hz.
- D. Voltage Rating: Determined by voltage of circuit indicated.

- E. Service Factor: According to NEMA MG 1, unless otherwise indicated.
- F. Capacity and Torque Characteristics: Rated for continuous duty and sufficient to start, accelerate, and operate connected loads at designated speeds, in indicated environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
- G. Enclosure: Open dripproof, unless otherwise indicated.
- H. Type: As indicated or selected by manufacturer from one of the following, to suit starting torque and other requirements of specific motor application.
 - 1. Permanent-split capacitor.
 - 2. Split-phase start, capacitor run.
 - 3. Capacitor start, capacitor run.
- I. Shaded-Pole Motors: Do not use, unless motors are smaller than 1/20 hp.
- J. Thermal Protection: Internal thermal protection shall automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal protection device automatically resets when motor temperature returns to normal range, unless otherwise indicated.
- K. Bearings: Ball-bearing type for belt-connected motors and other motors with high radial forces on motor shaft. Sealed, prelubricated sleeve bearings for other single-phase motors.

PART 3 – EXECUTION

3.01 ADJUSTING

- A. Use adjustable motor mounting bases for belt-driven motors.
- B. Align pulleys and install belts.
- C. Tension according to manufacturer's written instructions.

END OF SECTION

SECTION 15260

PIPE INSULATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes pipe insulation.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 15 Section "Supports and Anchors" for pipe insulation shields and protection saddles.

1.03 DEFINITIONS

- A. Hot Surfaces: Normal operating temperatures of 100 deg F (38 deg C) or higher.
- B. Dual-Temperature Surfaces: Normal operating temperatures that vary from hot to cold.
- C. Cold Surfaces: Normal operating temperatures less than 75 deg F (24 deg C).
- D. Thermal Conductivity (k-value): Measure of heat flow through a material at a given temperature difference; conductivity is expressed in units of Btu x inch/h x sq. ft. x deg F (W x m/sq. m x K).
- E. Density: Is expressed in pcf (kg/cu. m).

1.04 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of pipe insulation identifying k-value, thickness, and accessories.
- C. Samples of each type of insulation and jacket. Identify each sample describing product and intended use. Submit 12-inch long by 2-inch NPS sample materials for preformed pipe insulation.

- D. Material certificates, signed by the manufacturer, certifying that materials comply with specified requirements where laboratory test reports cannot be obtained.
- E. Material test reports prepared by a qualified independent testing laboratory. Certify that insulation meets specified requirements.

1.05 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Conform to the following characteristics for insulation including facings, cements, and adhesives, when tested according to ASTM E 84, by UL or other testing or inspecting organization acceptable to the authority having jurisdiction. Label insulation with appropriate markings of testing laboratory.
 - 1. Interior Insulation: Flame spread rating of 25 or less and a smoke developed rating of 50 or less.
 - 2. Exterior Insulation: Flame spread rating of 75 or less and a smoke developed rating of 150 or less.

1.06 SEQUENCING AND SCHEDULING

- A. Schedule insulation application after testing of piping systems.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Flexible Elastomeric Cellular:
 - a. Armstrong World Industries, Inc.
 - b. Halstead Industrial Products.
 - c. IMCOA.
 - d. Rubatex Corporation.

2.02 FLEXIBLE ELASTOMERIC CELLULAR

- A. Material: Flexible expanded closed-cell structure with smooth skin on both sides.
- B. Form: Tubular materials conforming to ASTM C 534, Type I.
- C. Thermal Conductivity: 0.30 Btu x inch/h x sq. ft. x deg F (0.043 W x m/sq. m x K) average maximum at 75 deg F (24 deg C).
- D. Coating: Water based latex enamel coating recommended by insulation manufacturer.

2.03 ADHESIVES

- A. Flexible Elastomeric Cellular Insulation Adhesive: Solvent-based, contact adhesive recommended by insulation manufacturer.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Surface Preparation: Clean, dry, and remove foreign materials such as rust, scale, and dirt.

3.02 INSTALLATION, GENERAL

- A. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping systems.
- B. Select accessories compatible with materials suitable for the service. Select accessories that do not corrode, soften, or otherwise attack the insulation or jacket in either the wet or dry state.
- C. Apply insulation material according to the manufacturer's printed instructions.
- D. Install insulation with smooth, straight, and even surfaces.
- E. Seal joints and seams to maintain vapor barrier on insulation.
- F. Seal penetrations for hangers, supports, anchors, and other projections in insulation requiring a vapor barrier.
- G. Cut ends of flexible elastomeric cellular insulation square and seal with adhesive.
- H. Apply adhesives and coatings at the manufacturer's recommended coverage-per-gallon rate.
- I. Keep insulation materials dry during application and finishing.
- J. Items Not Insulated: Unless otherwise indicated do not apply insulation to the following systems, materials, and equipment:
 - 1. Sanitary drainage and vent piping.
 - 2. Drainage piping located in crawl spaces, unless indicated otherwise.
 - 3. Below grade piping.
 - 4. Chrome-plated pipes and fittings.
 - 5. Piping specialties including air chambers, unions, and check valves.
- K. Tightly butt longitudinal seams and end joints. Bond with adhesive.
- L. Apply insulation continuously over fittings, valves, and specialties, except as otherwise indicated.
- M. Apply insulation with a minimum number of joints.

- N. Roof Penetrations: Apply insulation for interior applications to a point even with the top of the roof flashing. Seal with vapor barrier coating. Apply insulation for exterior applications butted tightly to interior insulation ends. Extend metal jacket for exterior insulation outside roof flashing at least 2 inches (50 mm) below top of roof flashing. Seal metal jacket to roof flashing with vapor barrier coating.
- O. Floor Penetrations: Terminate insulation underside of floor assembly and at floor support at top of floor.
- P. Hangers and Anchors: Apply insulation continuously through hangers and around anchor attachments. Install saddles as specified in Division 15 Section "Supports and Anchors." For cold surface piping, extend insulation on anchor legs a minimum of 12 inches (300 mm) and taper and seal insulation ends.

3.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION INSTALLATION

- A. Slip insulation on the pipe before making connections wherever possible. Seal joints with adhesive. Where the slip-on technique is not possible, cut one side longitudinally and apply to the pipe. Seal seams and joints with adhesive.
- B. Valves, Fittings, and Flanges: Cut insulation segments from pipe or sheet insulation. Bond to valve, fitting, and flange and seal joints with adhesive.
 - 1. Miter cut materials to cover soldered elbows and tees.
 - 2. Fabricate sleeve fitting covers from flexible elastomeric cellular insulation for screwed valves, fittings, and specialties. Miter cut materials. Overlap adjoining pipe insulation.

3.04 FINISHES

- A. Paint finished insulation as specified in Division 9 Section "Painting."
- B. Flexible Elastomeric Cellular Insulation: After adhesive has fully cured, apply 2 coats of protective coating to exposed insulation.

3.05 APPLICATIONS

- A. General: Materials and thicknesses are specified in schedules at the end of this Section.
- B. Interior, Exposed Piping Systems: Unless otherwise indicated, insulate the following piping systems:
 - 1. Domestic cold water.
 - 2. Domestic hot water.
 - 3. Refrigerant suction.
- C. Interior, Concealed Piping Systems: Unless otherwise indicated, insulate the following piping systems:
 - 1. Refrigerant suction.

- D. Exterior, Exposed Piping Systems: Unless otherwise indicated, insulate the following piping systems:

1. Refrigerant suction.

3.06 PIPE INSULATION

- A. Domestic Cold and Hot Water All Sizes (Interior): 1/2 inch (13 mm) thick, flexible elastomeric insulation. Field-applied jacket is not required.
- B. Refrigerant All Sizes (Interior and Exterior): 3/4 inch (19mm) thick, flexible elastomeric insulation. Field-applied jacket is not required.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15411

WATER DISTRIBUTION PIPING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes water distribution piping from locations indicated to fixtures and equipment inside building.
- B. Related Sections include the following:
 - 1. Division 15 Section "Plumbing Specialties" for water distribution piping specialties.

1.03 DEFINITIONS

- A. Water Service Piping: Water piping outside building that conveys water to building.
- B. Service Entrance Piping: Water piping at entry into building between water service piping and water distribution piping.
- C. Water Distribution Piping: Water piping inside building that conveys water to fixtures and equipment throughout the building.
- D. The following are industry abbreviations for plastic piping materials:
 - 1. CPVC: Chlorinated polyvinyl chloride.
 - 2. NP: Nylon.
 - 3. PB: Polybutylene.
 - 4. PE: Polyethylene.
 - 5. PP: Polypropylene.
 - 6. PVC: Polyvinyl chloride.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Service Entrance Piping: 160 psig (1100 kPa).
 - 2. Water Distribution Piping: 125 psig (860 kPa).

1.05 SUBMITTALS

- A. Water Samples, Test Results, and Reports: Specified in "Field Quality Control" and "Cleaning" articles.

1.06 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.
- B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water piping components. Include marking "NSF-pw" on plastic potable-water piping.
- D. Comply with NSF 61, "Drinking Water System Components--Health Effects," Sections 1 through 9 for potable-water piping and components.

PART 2 – PRODUCTS

2.01 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B), water tube, drawn temper.

2.02 PIPE AND TUBE FITTINGS

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper.
- C. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Include threads conforming to ASME B1.20.1 on threaded ends.
- D. Cast-Brass Fittings: Compression fittings or flare fittings, made to PE pipe or copper tube dimensions.

2.03 JOINING MATERIALS

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.
- B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for commonly used joining materials.

- C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.
- D. Brazing Filler Metal: AWS A5.8, BCuP, copper phosphorus or BAg, silver classification.
- E. Transition Couplings: Coupling or other manufactured fitting same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.

2.04 VALVES

- A. Refer to Division 15 Section "Valves" for general-duty valves.

PART 3 – EXECUTION

3.01 EXCAVATION

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.02 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- B. Fitting Option: Mechanically formed tee-branch outlets and brazed joints may be used on aboveground copper tubing.
- C. Aboveground, Water Distribution Piping: Use the following:
 - 1. 2-Inch NPS (DN50) and Smaller: Hard copper tube, Type L (Type B); copper, solder-joint fittings; and soldered joints.

3.03 VALVE APPLICATIONS

- A. Use ball valves exclusively.

3.04 PIPING INSTALLATION, GENERAL

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

3.05 SERVICE ENTRANCE PIPING INSTALLATION

- A. Extend service entrance piping to exterior water service piping in sizes and locations indicated for service entrances into building. Refer to Division 2 Section "Water Systems" for water service piping.

- B. Install shutoff valve, hose-end drain valve and pressure test plug inside building at each service entrance pipe.
- C. Install wall penetration system at each service entrance pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for wall penetration systems.

3.06 WATER DISTRIBUTION PIPING INSTALLATION

- A. Install piping with 0.25 percent slope downward toward drain.
- B. Install piping level without pitch.

3.07 JOINT CONSTRUCTION

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

3.08 VALVE INSTALLATION

- A. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.
- B. Shutoff Valves: Install shutoff valve on each water supply to equipment and where indicated. Use ball valves.
- C. Drain Valves: Install hose-end drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

3.09 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:
 - 1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.
 - 2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.
 - 3. Copper joist straps, MSS Type 26.
- B. Install supports according to Division 15 Section "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- E. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:

1. 3/4-Inch NPS (DN20) and Smaller: Maximum horizontal spacing, 60 inches (1500 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
2. 1-Inch NPS (DN25): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
3. 1-1/4-Inch NPS (DN32): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
4. 1-1/2 and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 96 inches (2400 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

3.10 CONNECTIONS

- A. Connect service entrance piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.
- B. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:
 1. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
 2. Plumbing Fixtures: Connect hot- and cold-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."

3.11 FIELD QUALITY CONTROL

- A. Inspect water distribution piping as follows:
- B. Inspect service entrance piping and water distribution piping as follows:
 1. Do not enclose, cover, or put piping into operation until it is inspected and approved by the Contracting Officer.
 2. During installation, notify the Contracting Officer at least 24 hours before inspection must be made. Perform tests specified below in presence of the Contracting Officer.
 - a. Roughing-In Inspection: Arrange for inspection of piping by Contracting Officer before concealing or closing-in, after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange for final inspection by the Contracting Officer to observe tests specified below and to ensure compliance with requirements.
 3. Reinspection: If the Contracting Officer finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
 4. Reports: Prepare inspection reports and have them signed by the Contracting Officer.
- C. Test water distribution piping as follows:
- D. Test service entrance piping and water distribution piping as follows:
 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
3. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
5. Prepare reports for tests and required corrective action.

3.12 CLEANING

- A. Clean and disinfect service entrance piping and water distribution piping as follows:
 1. Use purging and disinfecting procedure prescribed the Contracting Officer or, if method is not prescribed, procedure described in either AWWA C651 or AWWA C652 or as described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for 3 hours.
 - c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to the Contracting Officer. Repeat procedure if biological examination shows contamination.
- B. Prepare and submit reports to the Contracting Officer for purging and disinfecting activities.
- C. Clean interior of piping system. Remove dirt and debris as work progresses.

3.13 COMMISSIONING

- A. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.
- B. Perform the following steps before putting into operation:
 1. Close drain valves, hydrants, and hose bibbs.
 2. Open shutoff valves to fully open position.
 3. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
- C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

- D. Check plumbing specialties and verify proper settings, adjustments, and operation.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15420

DRAINAGE AND VENT PIPING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes sanitary drainage and vent piping inside and outside the building and to locations indicated.
- B. Related Sections include the following:
 - 1. Division 2 Section "Earthwork" for sanitary sewerage.
 - 2. Division 15 Section "Plumbing Specialties" for drainage and vent piping system specialties.

1.03 DEFINITIONS

- A. Sewerage Piping: Building sewer piping outside building that conveys sanitary sewage from building.
- B. Service Entrance Piping: Drainage piping at entry into building between outside building sewer piping and inside drainage piping.
- C. Drainage and Vent Piping: Piping inside building that conveys waste water and vapors from fixtures and equipment throughout the building.
- D. The following are industry abbreviations for plastic and other piping materials:
 - 1. ABS: Acrylonitrile-butadiene-styrene.
 - 2. EPDM: Ethylene-propylene-diene polymer, rubber.
 - 3. NBR: Acrylonitrile-butadiene rubber.
 - 4. PVC: Polyvinyl chloride.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with minimum working-pressure rating of 10-foot head of water (30 kPa).

1.05 SUBMITTALS

- A. Test Results and Reports: Specified in "Field Quality Control" Article.

1.06 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.
- B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 – PRODUCTS

2.01 PIPES AND TUBES

- A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
- B. PVC Plastic Pipe: ASTM D 2665, Schedule 40.

2.02 PIPE AND TUBE FITTINGS

- A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.
- B. Threaded-Fitting, End Connections: ASME B1.20.1.
- C. Hub-and-Spigot, Cast-Iron, Soil-Pipe Fittings: ASTM A 74, Service class, hub and spigot. Include ASTM C 564 rubber gasket, with dimensions required for pipe class, for each hub.
- D. Hubless, Cast-Iron, Soil-Pipe Fittings: CISPI 301.
- E. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311 drain, waste, and vent pipe patterns.
- F. PVC Plastic, Tubular Fittings: ASTM F 409 drainage pattern, with ends as required for application.

2.03 JOINING MATERIALS

- A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

- B. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for commonly used joining materials.
- C. Transition Couplings: Coupling or other manufactured fitting same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.

PART 3 – EXECUTION

3.01 EXCAVATION

- A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.02 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.
- B. Aboveground, Soil, Waste, and Vent Piping: Use the following:
 - 1. 1-1/4- and 1-1/2-Inch NPS (DN32 and DN40): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.
 - 2. 2- to 6-Inch NPS (DN50 to DN150): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.
- C. Underground, Soil, Waste, and Vent Piping: Use the following:
 - 1. 1-1/4- and 1-1/2-Inch NPS (DN32 and DN40): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.
 - 2. 2- to 6-Inch NPS (DN50 to DN150): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.
 - 3. 1-1/2-Inch NPS (DN40): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.
 - 4. 2- to 4-Inch NPS (DN50 to DN100): Hub-and-spigot, cast-iron soil pipe, Service class; hub-and-spigot, cast-iron, soil-pipe fittings, Service class; and compression joints.
 - 5. 2- to 4-Inch NPS (DN50 to DN100): PVC plastic pipe, PVC socket fittings, and solvent-cemented joints.

3.03 PIPING INSTALLATION, GENERAL

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation.

3.04 SERVICE ENTRANCE PIPING INSTALLATION

- A. Refer to Division 2 Section "Sewerage and Drainage" for sanitary and storm sewer piping.
- B. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.

- C. Extend building storm drain piping and connect to storm sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building storm drains and building storm sewers.
- D. Extend building storm drain, force-main piping and connect to storm sewer piping in size and location indicated for service entrance into building. Install cleanout, fitting with closure plug or equivalent, inside building.
- E. Install wall penetration system at each service entrance pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for wall penetration systems.

3.05 DRAINAGE AND VENT PIPING INSTALLATION

- A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.
- C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Sanitary Building Drain: 2 percent downward in direction of flow for piping 3-inch NPS (DN80) and smaller; 1 percent downward in direction of flow for piping 4-inch NPS (DN100) and larger.
 - 2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- E. Sleeves are not required for cast-iron soil piping passing through concrete slab on grade if slab is without membrane waterproofing.
- F. Install PVC plastic drainage piping according to ASTM D 2665.
- G. Install underground, PVC plastic drainage piping according to ASTM D 2321.

3.06 JOINT CONSTRUCTION

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. PVC Piping Joints: Join drainage piping according to ASTM D 2665.

- C. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling during joining of plastic pipe and fittings.

3.07 VALVE INSTALLATION

- A. Shutoff Valves: Install shutoff valve on each pump discharge and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.
- B. Check Valves: Install swing check valve on each pump discharge, downstream from shutoff valve.

3.08 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:
 - 1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.
 - 2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.
 - 3. Joist Straps, MSS Type 26.
- B. Install supports according to Division 15 Section "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- E. Install hangers for PVC plastic piping with the following maximum spacing and minimum rod diameters:
 - 1. 1-1/2- and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 48 inches (1200 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).
 - 2. 3 NPS (DN75): Maximum horizontal spacing, 48 inches (1200 mm) with 1/2-inch (13-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).
 - 3. 4 NPS (DN100): Maximum horizontal spacing, 48 inches (1200 mm) with 5/8-inch (16-mm) minimum rod diameter; maximum vertical spacing, 48 inches (1200 mm).
- F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.09 CONNECTIONS

- A. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage piping to service entrance piping, and extend to and connect to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Fixtures."

2. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section "Plumbing Specialties."
3. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection.

3.10 FIELD QUALITY CONTROL

A. Inspect drainage and vent piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by the Contracting Officer.
2. During installation, notify the Contracting Officer at least 24 hours before inspection must be made. Perform tests specified below in presence of the Contracting Officer.
 - a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange for final inspection by the Contracting Officer to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If the Contracting Officer finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by the Contracting Officer.

B. Test drainage and vent piping according to procedures of the Contracting Officer or, in absence of published procedure, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10 feet of head (30 kPa). Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.
4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action. Provide a copy of all reports to the Contracting Officer.

3.11 CLEANING AND PROTECTING

- A. Clean interior of piping system. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with 2 coats of water-based latex paint.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15430
PLUMBING SPECIALTIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes plumbing specialties for the following:
 - 1. Water distribution systems.
 - 2. Soil, waste, and vent systems.
- B. Related Sections include the following:
 - 1. Division 15 Section "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.
 - 2. Division 15 Section "Valves" for ball and check valves.
 - 3. Division 15 Section "Water Distribution Piping" for water-supply piping and connections.
 - 4. Division 15 Section "Drainage and Vent Piping" for drainage and vent piping and connections.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Water Distribution Piping: 125 psig (860 kPa).
 - 2. Soil, Waste, and Vent Piping: 10-foot head of water (30 kPa).
 - 3. Storm Drainage Piping: 10-foot head of water (30 kPa).

1.04 SUBMITTALS

- A. Product Data: For each plumbing specialty indicated. Include rated capacities of selected equipment and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:
 - 1. Water hammer arresters.
 - 2. Trap seal primer valves.
 - 3. Drain valves.
 - 4. Hose bibbs and hydrants.

5. Outlet boxes and washer-supply outlets.
6. Cleanouts.
7. Floor drains.
8. Vent caps, vent terminals, and roof flashing assemblies.
9. Sleeve penetration systems.

- B. Maintenance Data: For specialties to include in the maintenance manuals specified in Division 1. Include the following:

1. Trap seal primer valves.

1.05 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on plumbing specialties made to specified standards.
- B. Listing and Labeling: Provide electrically operated plumbing specialties specified in this Section that are listed and labeled.
1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- C. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- D. Comply with NFPA 70, "National Electrical Code," for electrical components.
- E. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic water piping components. Include marking "NSF-dwv" on plastic drain, waste, and vent piping.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Dishwasher Air-Gap Fittings:
 - a. B & K Industries, Inc.
 - b. Brass Craft.
 - c. Brasstech, Inc.
 - d. Bristol Corp.; J & B Products Div.
 - e. Moen, Inc.; Dearborn Brass Co. Div.
 - f. Sioux Chief Manufacturing Co., Inc.
 2. Washer-Supply Outlets:
 - a. B & K Industries, Inc.
 - b. IMI Cash Valve.
 - c. Symmons Industries, Inc.
 - d. Watts Industries, Inc.; Water Products Div.

3. Hydrants:

- a. Josam Co.
- b. Smith: Jay R. Smith Mfg. Co.
- c. Tyler Pipe; Wade Div.
- d. Watts Industries, Inc.; Ancon Drain Div.
- e. Watts Industries, Inc.; Water Products Div.
- f. Woodford Manufacturing Co.
- g. Zurn Industries, Inc.; Hydromechanics Div.

4. Water Hammer Arresters:

- a. Amtrol, Inc.
- b. Josam Co.
- c. Precision Plumbing Products, Inc.
- d. Sioux Chief Manufacturing Co., Inc.
- e. Smith: Jay R. Smith Mfg. Co.
- f. Tyler Pipe; Wade Div.
- g. Watts Industries, Inc.; Ancon Drain Div.
- h. Watts Industries, Inc.; Water Products Div.
- i. Zurn Industries, Inc.; Hydromechanics Div.

2.02 BACKFLOW PREVENTERS

- A. General: ASSE standard, backflow preventers, of size indicated for maximum flow rate and maximum pressure loss indicated.
 - 1. 2-Inch NPS (DN50) and Smaller: Bronze body with threaded ends.
 - 2. Exterior Finish: Polished chrome-plate if used in chrome-plated piping system.
- B. Hose-Connection Vacuum Breakers: ASSE 1011, nickel plated, with nonremovable and manual drain features, and ASME B1.20.7 garden-hose threads on outlet. Units attached to rough-bronze-finish hose connections may be rough bronze.

2.03 DISHWASHER AIR-GAP FITTINGS

- A. Description: ASSE 1021, fitting suitable for use with domestic dishwashers and for deck mounting; with plastic body, chrome-plated brass cover; and capacity of at least 5 gpm (0.32 L/s); and inlet pressure of at least 5 psig (35 kPa) at temperature of at least 140 deg F (60 deg C). Include 5/8-inch- (16-mm-) ID inlet and 7/8-inch- (22-mm-) ID outlet hose connections.

2.04 WASHER-SUPPLY OUTLETS

- A. Description: Surface-mounting, washer-supply outlet fittings complying with ASME A112.18.1M and reinforcement. Include the following:
 - 1. Shutoff Fitting: Combination, single lever.
 - 2. Reinforcement: 2-by-4-inch- or 2-by-6-inch- (38-by-89-mm- or 38-by-140-mm-), fire-retardant-treated-wood blocking between studs.

2.05 HYDRANTS

- A. Wall Hydrants: ASME A112.21.3M, nonfreeze. Provide handwheel.
 - 1. Inlet: 3/4- or 1-inch NPS (DN20 or DN25) threaded or solder joint.
 - 2. Outlet: ASME B1.20.7 garden-hose threads, and integral or field-installed, nonremovable, drainable, hose-connection vacuum breaker with ASME B1.20.7 garden-hose threads on outlet.
 - 3. Type: Projecting.
 - 4. Finish: Rough bronze.

2.06 DRAIN VALVES

- A. Hose-End Drain Valves: MSS SP-110, 3/4-inch NPS (DN20) ball valve, rated for 400-psig (2760-kPa) minimum CWP. Include 2-piece, ASTM B 62 bronze body with standard port, chrome-plated brass ball, replaceable seats and seals, blowout-proof stem, and vinyl-covered steel handle.
 - 1. Inlet: Threaded joint.
 - 2. Outlet: Short-threaded nipple with ASME B1.20.7 garden-hose thread and cap.

2.07 MISCELLANEOUS PIPING SPECIALTIES

- A. Water Hammer Arresters: ASME A112.26.1M, ASSE 1010, or PDI-WH 201, bellows or piston type with pressurized cushioning chamber. Sizes are based on water-supply fixture units, ASME A112.26.1M or PDI-WH 201 sizes A through F.
- B. Hose Bibbs: Bronze body, with renewable composition disc, 3/4-inch NPS (DN20) threaded inlet. Provide ASME B1.20.7 garden-hose threads on outlet and integral or field-installed, nonremovable, drainable, hose-connection vacuum breaker.
 - 1. Finish: Rough brass.
 - 2. Operation: Wheel handle.
- C. Open Drains: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section of length to provide depth indicated; and where indicated, increaser fitting of size indicated, joined with ASTM C 564 rubber gaskets. Size P-trap as indicated.
- D. Floor-Drain Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.
- E. Floor-Drain Outlet Fittings: Cast iron or bronze body, with removable ball float, threaded inlet and threaded or spigot outlet.

PART 3 – EXECUTION

3.01 PLUMBING SPECIALTY INSTALLATION

- A. General: Install plumbing specialty components, connections, and devices according to manufacturer's written instructions.

- B. Install hose bibbs with integral or field-installed vacuum breaker.
- C. Install wall hydrants with integral or field-installed vacuum breaker.
- D. Install cleanouts in aboveground piping and building drain piping as indicated, and where not indicated, according to the following:
 - 1. Size same as drainage piping up to 4-inch NPS (DN100). Use 4-inch NPS (DN100) for larger drainage piping unless larger cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 50 feet (15 m) for piping 4-inch NPS (DN100) and smaller and 100 feet (30 m) for larger piping.
 - 4. Locate at base of each vertical soil and waste stack.
- E. Install cleanout deck plates, of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.
- F. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.
- G. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch (25-mm) clearance between vent pipe and roof substrate.
- H. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor or as indicated. Size outlets as indicated.
- I. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - 1. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.
 - 2. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to one percent slope.
 - 3. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.
- J. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- K. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
- L. Fasten recessed, wall-mounting plumbing specialties to reinforcement built into walls.
- M. Secure supplies to supports or substrate.
- N. Install individual stop valve in each water supply to plumbing specialties. Use ball valve if specific valve is not indicated.
- O. Install water-supply stop valves in accessible locations.
- P. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

- Q. Locate drainage piping as close as possible to bottom of floor slab supporting fixtures and drains.
- R. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.
- S. Include wood-blocking reinforcement for recessed and wall-mounting plumbing specialties.

3.02 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:
 - 1. Install piping connections between plumbing specialties and piping specified in other Division 15 Sections.
 - 2. Install piping connections indicated between appliances and equipment specified in other Sections; connect directly to plumbing piping systems.
 - 3. Install piping connections indicated as indirect wastes from appliances and equipment specified in other Sections, to spill over receptors connected to plumbing piping systems.
- B. Supply Runouts to Plumbing Specialties: Install hot- and cold-water-supply piping of sizes indicated, but not smaller than required by the Contracting Officer.
- C. Drainage Runouts to Plumbing Specialties: Install drainage and vent piping, with approved trap, of sizes indicated, but not smaller than required by the Contracting Officer.

3.03 COMMISSIONING

- A. Before startup, perform the following checks:
 - 1. System tests are complete.
 - 2. Damaged and defective specialties and accessories have been replaced or repaired.
 - 3. Clear space is provided for servicing specialties.
- B. Before operating systems, perform the following steps:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open general-duty valves to fully open position.
 - 3. Remove and clean strainers.
 - 4. Verify that drainage and vent piping are clear of obstructions. Flush with water until clear.
- C. Adjust operation and correct deficiencies discovered during commissioning.

3.04 DEMONSTRATION

- A. Startup Services: Engage a factory-authorized service representative to perform startup services and train Government maintenance personnel as specified below:

1. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."

3.05 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

SECTION 15440

PLUMBING FIXTURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes plumbing fixtures and trim, faucets, other fittings, and related components.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 7 Section "Joint Sealers" for sealing between fixtures and walls, floors, and counters.
 - 2. Division 15 Section "Plumbing Specialties" for backflow preventers and other specialties not specified in this Section.

1.03 DEFINITIONS

- A. Accessible: Plumbing fixture, building, facility, or portion thereof that can be approached, entered, and used by physically handicapped, disabled, and elderly people.
- B. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, traps and waste pipes. Pipe fittings, tube fittings, and general-duty valves are included where indicated.

1.04 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each plumbing fixture category and type specified. Include selected fixture, trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.
- C. Wiring diagrams from manufacturer for electrically operated units.
- D. Maintenance data for plumbing fixtures and components to include in the operation and maintenance manuals specified in Division 1.

1.05 QUALITY ASSURANCE

- A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category from one source and by a single manufacturer.
 - 1. Exception: Where fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for this category.
- B. Regulatory Requirements: Comply with requirements of CABO A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; regarding plumbing fixtures for physically handicapped people.
- C. Energy Policy Act Requirements: Comply with requirements of Public Law 102-486, "Energy Policy Act," regarding water flow rate and water consumption of plumbing fixtures.
- D. Listing and Labeling: Provide electrically operated fixtures and components specified in this Section that are listed and labeled.
- E. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.
- B. Store plumbing fixtures on elevated platforms in dry location.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Coordinate roughing-in and final fixture locations and verify that plumbing fixtures can be installed to comply with original design and referenced standards.

PART 2 – PRODUCTS

2.01 PLUMBING FIXTURE STANDARDS

- A. Products: Subject to compliance with requirements, provide products by one of the following:
- B. Stainless-Steel Sink: (Double Bowl)
 - 1. Elkay Manufacturing Co.
 - 2. Just Manufacturing Co.
 - 3. Kohler Co.
 - 4. Moen, Inc.
 - 5. UNR Home Products.

- 6. American Standard, Inc.
- C. Plastic Laundry Sinks:
 - 1. Aqua Glass Corp.
 - 2. Fiat Products, Inc.
 - 3. Florestone Products Co.
 - 4. Mustee: E.L. Mustee and Stones Inc.
 - 5. Swan Corp.
- D. Comply with applicable standards below and other requirements specified.
 - 1. Plastic Laundry Trays: ANSI Z124.6.
 - 2. Stainless-Steel Fixtures Other than Service Sinks: ASME A112.19.3M.

2.02 SINK FAUCET STANDARDS

- A. Products: Subject to compliance with requirements, provide products by one of the following:
- B. Faucet (Kitchen sink, and Laundry Sink):
 - 1. American Standard, Inc.
 - 2. Crane Plumbing.
 - 3. Eljer Industries.
 - 4. Elkay Manufacturing Co.
 - 5. Kohler Co.
 - 6. Masco Corp.; Delta Faucet Co.
 - 7. Moen, Inc.
 - 8. Price Pfister, Inc.
 - 9. Speakman Co.
 - 10. Universal-Rundle Corp.
- C. Comply with ASME A112.18.1M and other requirements specified for lavatory, sink, and similar-type-fixture faucet fittings. Include hot- and cold-water indicators; 2.5-gpm- (0.16-L/s-) maximum flow rate; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.
 - 1. Pipe Threads: ASME B1.20.1.
 - 2. Single – metal lever handle.

2.03 MISCELLANEOUS FITTING STANDARDS

- A. Comply with ASME A112.18.1M and other requirements specified for fittings, other than faucets. Include polished, chrome-plated finish, except where otherwise indicated. Coordinate fittings with other components and connectors.
 - 1. Brass and Copper, Supplies and Tubular Brass: ASME A112.18.1M.
 - 2. Fixed Flow Restrictors: ASSE 1034.
 - 3. Plastic Tubular Fittings: ASTM F 409.

2.04 MISCELLANEOUS COMPONENT STANDARDS

- A. Products: Subject to compliance with requirements, provide products by one of the following:
- B. Disposer:
 - 1. Emerson Electric Co.; In-Sink-Erator Div.
 - 2. General Electric Co.; GE Answer Center.
 - 3. Kitchen Aid, Inc.
 - 4. Waste King, Inc.
- C. Comply with applicable standards below and other requirements specified for components for plumbing fixtures, equipment, and appliances.
 - 1. Disposers: ASSE 1008 and UL 430.
 - 2. Pipe Threads: ASME B1.20.1.

2.05 FITTINGS

- A. Fittings for Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for materials for supplies, supply stops, supply risers, traps, and other fittings.
- B. Fittings for Equipment Specified in Other Sections: Fittings include the following:
 - 1. Supply Inlets: Brass pipe or copper tube, size required for final connection.
 - 2. Supply Stops: Chrome-plated brass, angle or straight; compression, wheel-handle type; same size as supply inlet and with outlet matching supply riser.
 - 3. Supply Risers: 3/8-inch NPS (DN10) flexible copper tube with knob end. Use chrome-plated tube for exposed applications.
 - 4. Traps: Tubular brass with 0.045-inch (1.1 mm) wall thickness, slip-joint inlet, cleanout, wall flange, escutcheons, and size to match equipment. Use chrome-plated tube for exposed applications.
 - 5. Continuous Waste: Tubular plastic with slip-joint inlet and size to match equipment.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine roughing-in for potable, hot- and cold-water supply piping systems; soil, waste, and vent piping systems; and supports. Verify that locations and sizes of piping and locations and types of supports match those indicated, before installing and connecting fixtures. Use manufacturer's roughing-in data when roughing-in data are not indicated.
- B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

- A. Include supports for plumbing fixtures according to the following:
 - 1. Fabricate reinforcement from 2-by-4-inch or 2-by-6-inch (38-by-89-mm or 38-by-140-mm) fire-retardant-treated-wood blocking between studs or 1/4-by-6-inch (6.35-by-152.4-mm) steel plates attached to studs, in wall construction, to secure fixtures to wall. Include length that will extend beyond ends of fixture mounting bracket and attach to at least 2 studs.

3.03 PLUMBING FIXTURE INSTALLATION

- A. Assemble plumbing fixtures and trim, fittings, faucets, and other components according to manufacturers' written instructions.
- B. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.
- C. Fasten wall-mounted fittings to reinforcement built into walls.
- D. Fasten counter-mounting plumbing fixtures to casework.
- E. Secure supplies to supports or substrate within pipe space behind fixture.
- F. Install individual stop valve in each water supply to fixture.
- G. Install water-supply stop valves in accessible locations.
- H. Install traps on fixture outlets.
- I. Install disposers in sink outlets. Install switch where indicated, or in wall adjacent to sink if location is not indicated.
- J. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.
- K. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements specified in Division 7 Section "Joint Sealants." Match sealant color to fixture color.

3.04 CONNECTIONS

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:
 - 1. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 15 Sections.
- B. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for fitting sizes and connection requirements for each plumbing fixture.

- C. Supply and Waste Connections to Equipment Specified in Other Sections: Connect equipment with supply inlets and supply stops specified in this Section. Use fitting sizes required to match connected equipment. Connect fittings to plumbing piping.
- D. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 16 Sections.

3.05 FIELD QUALITY CONTROL

- A. Verify that installed fixtures are categories and types specified for locations where installed.
- B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.
- C. Inspect installed fixtures for damage. Replace damaged fixtures and components.
- D. Test installed fixtures after water systems are pressurized and demonstrate proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.06 ADJUSTING AND CLEANING

- A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.
- B. Operate and adjust disposers and controls. Replace damaged and malfunctioning units and controls.
- C. Replace washers and seals of leaking and dripping faucets and stops.
- D. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Include the following:
 - 1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
 - 2. Remove sediment and debris from drains.

3.07 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of fixtures for temporary facilities, except when approved in writing by Contracting Officer.

END OF SECTION

SECTION 15452

SUMP PUMPS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following types of pumps for permanent installation in plumbing systems:
 - 1. Sump pumps.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Motors" for pump motors.
 - 2. Division 15 Section "Plumbing Piping" for piping not specified in this Section.
 - 3. Division 16 Sections for power-supply wiring, field-installed disconnects, required electrical devices, and motor controllers.

1.03 DEFINITIONS

- A. Sump Pumps: Type suitable for lifting waste water not containing solids from a sump or wet location to a point of discharge. Pumps normally have strainer on inlet. This type includes wet-pit-mounted, vertical sump pumps and submersible sump pumps.

1.04 PUMP PERFORMANCE REQUIREMENTS

- A. Pump Pressure Ratings: At least equal to maximum pump-operating pressure.

1.05 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data including certified performance curves, weights (shipping, installed, and operating), furnished specialties, and accessories. Include startup instructions.
- C. Shop drawings showing layout and connections for pumps. Include setting drawings with templates, directions for installation of foundation and anchor bolts, and other anchorages.

- D. Wiring diagrams detailing wiring for power, signal, and control systems differentiating between manufacturer-installed wiring and field-installed wiring.
- E. Product certificates signed by pump manufacturers certifying accuracies under specified operating conditions and compliance with specified requirements.

1.06 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with provisions of the following:
 - 1. ASME B31.9 "Building Services Piping" for piping materials and installation.
 - 2. "Hydraulic Institute Standards for Centrifugal, Rotary and Reciprocating Pumps" for pump design, manufacture, and installation.
 - 3. UL 778 "Standard for Motor Operated Water Pumps" for construction requirements. Include UL listing and labeling.
 - 4. NEMA MG 1 "Standard for Motors and Generators" for electric motors. Include NEMA listing and labeling.
 - 5. NFPA 70 "National Electrical Code" for electrical components and installation.
- B. Single-Source Responsibility: Obtain same type of pumps from a single manufacturer.
- C. Single-Source Responsibility: Obtain same type of pumps from a single manufacturer with pumps, components, and accessories from a single source. Include responsibility and accountability to answer and resolve problems regarding compatibility, installation, performance, and acceptance of pumps.
- D. Design Criteria: Drawings indicate sizes, profiles, connections, and dimensional requirements of pumps and are based on specific manufacturer types and models indicated. Pumps having equal performance characteristics by other manufacturers may be considered provided that deviations in dimensions and profiles do not change the design concept or intended performance as judged by the Contracting Officer. The burden of proof for equality of pumps is on the proposer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store pumps in a clean, dry location.
- B. Retain shipping flange protective covers and protective coatings during storage.
- C. Protect bearings and couplings against damage from sand, grit, or other foreign matter.
- D. Extended Storage Greater Than 5 Days on Site: Dry internal parts with hot air or a vacuum-producing device. After drying, coat internal parts with light oil, kerosene, or antifreeze. Dismantle bearings and couplings, dry and coat with an acid-free heavy oil, and tag and store in a dry location.
- E. Comply with pump manufacturer's rigging instructions for handling.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Submersible Sump Pumps:
 - a. Aurora Pumps, General Signal.
 - b. Federal Pump Corp.
 - c. Peerless Pumps.
 - d. Grundfos Pumps Corp.
 - e. Liberty Pumps.
 - f. Sta-Rite Industries, Inc.
 - g. Weil Pump Co.
 - h. Weinman by AMW Industries.
 - i. Zoeller Co.

2.02 PUMPS, GENERAL

- A. Plumbing Pumps: Factory assembled and tested, and of construction required for permanent installation.
- B. Motors: NEMA MG 1; single speed with type of enclosure and electrical characteristics indicated. Include built-in thermal-overload protection and grease-lubricated ball bearings. Motors are non-overloading within full range of pump performance curves.
- C. Finish: Manufacturer's standard paint applied to factory-assembled and -tested plumbing pump unit prior to shipping.
- D. Manufacturer's Preparation for Shipping: Clean exposed machined metal surfaces and treat with anticorrosion compound after assembly and testing. Protect pipe openings, and nozzles with wooden flange covers or with screwed-in plugs.

2.03 SUMP PUMPS

- A. General Description: Centrifugal, end-suction, single-stage sump pump, with inlet strainer, motor, and operating controls.
- B. Impeller: ASTM B 584 cast bronze, statically and dynamically balanced, open or semiopen, overhung, single suction, keyed to shaft, and secured by locking capscrew.
- C. Submersible, Waste-Water Sump Pumps: Simplex, submersible, direct-connected type, with basin cover with holes with gaskets in cover as required.
 1. Casing: Cast iron with integral, cast-iron inlet strainer. Include discharge companion flange arranged for vertical discharge and suitable for plain-end pipe connection.
 2. Pump and Motor Shaft: Stainless steel, with factory-sealed, grease-lubricated ball bearings.
 3. Seal: Mechanical seal.

4. Motor: Hermetically sealed capacitor-start type, with built-in overload protection. Include a 3-conductor waterproof power cable of length required, but not less than 10 feet (3 m), with a grounding plug and cable-sealing assembly for connection at pump.
5. Pump Discharge Piping: Factory or field fabricated, Schedule 40 PVC.
6. Controls: 120 volts a.c., NEMA 250, Type 6 micro-pressure or mercury float switches, mounted on pump.
7. Pump shall be rated for 156 p.m. at 15 feet of head, maximum h.p. motor.

1.04 GENERAL-DUTY VALVES

- A. Refer to Division 15 Section "Valves" for general-duty ball and check valves.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas, equipment foundations, and conditions with Installer present for compliance with requirements for installation and other conditions affecting performance of pumps. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in of plumbing piping systems to verify actual locations of piping connections prior to pump installation.

1.02 INSTALLATION

- A. General: Comply with pump manufacturer's written installation instructions.
- B. Install pumps in locations indicated and arrange to provide access for periodic maintenance, including removal of motors, impellers, couplings, and accessories.
- C. Support piping so that weight of piping is not supported by pumps.
- D. Submersible Sump Pumps: Install submersible sump pumps, set on basin floor.

1.03 CONNECTIONS

- A. General: Connect piping to pumps as indicated. Install valves that are same size as piping connecting to pumps.
- B. Install discharge pipe sizes equal to or greater than diameter of pump nozzles.
- C. Install check valve and ball valve on each sump pump discharge.
- D. Install electrical connections for power, controls, and devices.
- E. Electrical power and control wiring and connections are specified in Division 16 Sections.

1.04 ADJUSTING

- A. Pump Controls: Set pump controls for automatic start and stop. Operation as required for system application.

1.05 COMMISSIONING

- A. Final Checks Before Startup: Perform the following preventive maintenance operations and checks before startup:
 - 1. Lubricate oil-lubricated-type bearings.
 - 2. Remove grease-lubricated bearing covers and flush bearings with kerosene and thoroughly clean. Fill with new lubricant according to manufacturer's recommendations.
 - 3. Disconnect couplings and check motors for proper rotation. Rotation shall match direction of rotation marked on pump casing.
 - 4. Check that pumps are free to rotate by hand. Do not operate pump, if bound or even drags slightly, until cause of trouble is determined and corrected.
 - 5. Check that pump controls are correct for required application.
- B. Starting procedure for pumps with shutoff power not exceeding safe motor power:
 - 1. Start motors.
 - 2. Open discharge valves slowly.
 - 3. Check general mechanical operation of pumps and motors.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15496
NATURAL GAS PIPING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes piping, specialties, and accessories for natural gas systems within building and to gas meters.
- B. This Section includes piping, specialties, and accessories for natural gas systems within building and to point indicated.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 2 Section "Gas Distribution Systems" for natural gas service piping.

1.03 DEFINITIONS

- A. Low-Pressure Natural Gas Piping: Operating pressure of 0.5 psig (3.45 kPa) or less.
- B. Medium-Pressure Natural Gas Piping: Operating pressure greater than 0.5 psig (3.45 kPa), but not greater than 2 psig (13.8 kPa).
- C. Gas Service: Pipe from gas main or other source to gas point of delivery for building being served. Piping includes gas service piping, gas valve, service pressure regulator, meter bar or meter support, and gas meter.
- D. Gas Delivery Point: Gas meter or service pressure regulator outlet, or gas service valve if gas meter is not provided.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. Minimum Working-Pressure Ratings: Except where otherwise indicated, minimum pressure requirements are as follows:
 - 1. Low-Pressure Natural Gas Piping: 2 psig (13.8 kPa).

2. Medium-Pressure Natural Gas Piping: 10 psig (69.0 kPa).

- B. Approximate values of natural gas supplied for these systems are as follows:

1. Heating Value: 1000 Btu/cu. ft. (37.3 MJ/cu. m).
2. Specific Gravity: 0.6.
3. Service Line Pressure: 15 to 20 psig (103 kPa to 138 kPa).

1.05 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of natural gas specialty and special-duty valve. Include pressure rating, rated capacity, and settings of selected models.

1.06 QUALITY ASSURANCE

- A. Comply with NFPA 54, "National Fuel Gas Code," for gas piping materials and components; installations; and inspecting, testing, and purging.
- B. Provide listing/approval stamp, label, or other marking on equipment made to specified standards.
- C. Listing and Labeling: Provide equipment and accessories specified in this Section that are listed and labeled.
1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handling Flammable Liquids: Remove and legally dispose of liquids from drips in existing gas piping. Handle cautiously to avoid spillage and ignition. Notify gas supplier. Handle flammable liquids used by Installer with proper precautions and do not leave on premises from end of one day to beginning of next day.

1.08 SEQUENCING AND SCHEDULING

- A. Notification of Interruption of Service: Notify each affected user when gas supply will be turned off.
- B. Work Interruptions: Leave gas piping systems in safe condition when interruptions in work occur during repairs or alterations to existing gas piping systems.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Gas Stops, 2-Inch NPS (DN50) and Smaller:
 - a. Hammond Valve Corp.
 - b. Jomar International, Ltd.
 - c. Maxitrol Co.
 - d. McDonald: A.Y. McDonald Mfg. Co.
 - e. Milwaukee Valve Co., Inc.
 - f. Mueller Co.
 - g. National Meter.
2. Gas Valves, 2-Inch NPS (DN50) and Smaller:
 - a. Conbraco Industries, Inc.; Apollo Div.
 - b. Core Industries, Inc.; Mueller Steam Specialty Div.
 - c. Huber: J.M. Huber Corp.; Flow Control Div.
 - d. McDonald: A.Y. McDonald Mfg. Co.
 - e. Milliken Valve Co., Inc.
 - f. Milwaukee Valve Co., Inc.
 - g. Mueller Co.
 - h. National Meter.
 - i. Nordstrom Valves, Inc.
 - j. Olson Technologies, Inc.

2.02 PIPES AND TUBES

A. Steel Pipe: ASTM A 53; Type E, electric-resistance welded or Type S, seamless; Grade B; Schedule 40; black.

2.03 PIPE AND TUBE FITTINGS

- A. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threaded ends conforming to ASME B1.20.1.
- B. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends conforming to ASME B1.20.1.
- C. Transition Fittings: Type, material, and end connections to match piping being joined.

2.04 JOINING MATERIALS

- A. Common Joining Materials: Refer to Division 15 Section "Basic Mechanical Materials and Methods" for joining materials not included in this Section.
- B. Joint Compound and Tape: Suitable for natural gas.

2.05 VALVES

- A. Manual Valves: Conform to standards listed or, where appropriate, to ANSI Z21.15.
- B. Gas Stops, 2-Inch NPS (DN50) and Smaller: AGA-certified, bronze-body, plug type with bronze plug, ball type with chrome-plated brass ball, or butterfly valve with stainless-steel disc and fluorocarbon elastomer seal, for 2 psig (13.8 kPa) or less natural gas. Include AGA stamp, flat or square head or lever handle, and threaded ends conforming to ASME B1.20.1.

2.06 PIPING SPECIALTIES

- A. Flexible Connectors may only be used when furnished with equipment, such as a furnace.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Comply with NFPA 54 Paragraph "Prevention of Accidental Ignition."

3.02 PIPING APPLICATIONS

- A. General: Unions, transition and special fittings, and valves with pressure ratings same as or higher than system pressure rating may be used in applications below, except where otherwise indicated.
- B. Low-Pressure, 0.5 psig (3.45 kPa) or Less, Natural Gas Systems: Use the following:
 - 1. 1-Inch NPS (DN25) and Smaller: Steel pipe, malleable-iron threaded fittings, and threaded joints.
 - 2. 1-1/4- to 2-Inch NPS (DN32 to DN50): Steel pipe, malleable-iron threaded fittings, and threaded joints.
- C. Medium-Pressure, 0.5 (3.45) and higher, Natural Gas Systems: Use the following:
 - 1. 1-Inch NPS (DN25) and Smaller: Steel pipe, butt-welding fittings, and welded joints.

2. 1-1/4-Inch NPS (DN32) and Larger: Steel pipe, butt-welding fittings, and welded joints.

3.03 VALVE APPLICATIONS

- A. Use gas stops for shutoff to appliances with 2-inch NPS (DN50) or smaller low-pressure gas supply.
- B. Use gas valves of sizes indicated for gas service piping, mains, and where indicated.

3.04 PIPING INSTALLATIONS

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping installation requirements.
- B. Concealed Locations: Except as specified below, install concealed gas piping in airtight conduit constructed of Schedule 40, seamless, black steel pipe with welded joints. Vent conduit to outside and terminate with screened vent cap.
 1. Above-Ceiling Locations: Gas piping may be installed in accessible spaces, subject to approval of the Contracting Officer, whether or not such spaces are used as plenums. Do not locate valves in such spaces.
 2. In Floors: Do not run piping in or under concrete slabs.
 3. In Floor Channels: Do not install piping in floor channels.
 4. In Partitions: Do not install concealed piping in solid partitions. Protect tubing from physical damage when installed inside partitions or hollow walls.
 - a. Exception: Piping and Tubing passing through partitions or walls, shall be sleeved.
 5. Prohibited Locations: Do not install gas piping in or through circulating air ducts, clothes or trash chutes, chimneys or gas vents (flues), ventilating ducts, or dumbwaiter or elevator shafts.
 - a. Exception: Accessible above-ceiling space specified above.
- C. Drips and Sediment Traps: Install drips at points where condensate may collect. Include outlets of gas meters. Locate where readily accessible to permit cleaning and emptying. Do not install where condensate would be subject to freezing.
 1. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped. Use minimum-length nipple of 3 pipe diameters, but not less than 3 inches (75 mm) long, and same size as connected pipe. Install with space between bottom of drip and floor for removal of plug or cap.
- D. Conceal pipe installations in walls, pipe spaces, utility spaces and above ceilings, except where indicated to be exposed to view.

- E. Install gas piping at uniform grade of 0.1 percent slope upward toward risers.
- F. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.
- G. Connect branch piping from top or side of horizontal piping.
- H. Install unions in pipes 2-inch NPS (DN50) and smaller, adjacent to each valve, at final connection to each piece of equipment, and elsewhere as indicated.
- I. Install corrugated stainless-steel tube and fittings according to manufacturer's written instructions. Include striker plates to protect tubing from puncture where tubing is restrained and cannot move.
- J. Install dielectric unions with ferrous and brass or bronze end connections, separated by insulating material, where piping of dissimilar metals is joined.
- K. Anchor piping to ensure proper direction of piping expansion and contraction. Install expansion joints, expansion loops, and pipe guides as indicated.
- L. Install containment conduits for gas piping below slabs, within building, in gastight conduits extending minimum of 4 inches (100 mm) outside building, and vented to atmosphere. Terminate vents with turned-down, reducing-elbow fittings with corrosion-resistant insect screens in large end. Prepare and paint outside of conduits with coal-tar epoxy-polyamide paint according to SSPC-Paint 16.

3.05 JOINT CONSTRUCTION

- A. Refer to Division 15 Section "Basic Mechanical Materials and Methods" for basic piping joint construction.

3.06 VALVE INSTALLATION

- A. Install valves in accessible locations, protected from damage.
- B. Install gas valve upstream from each gas pressure regulator. Where 2 gas pressure regulators are installed in series, valve is not required at second regulator.
- C. Install pressure relief or pressure-limiting devices so they can be readily operated to determine if valve is free; test to determine pressure at which they will operate; and examine for leakage when in closed position.

3.07 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section "Hangers and Supports" for pipe hanger and support devices.

- B. Install hangers for horizontal steel piping with the following maximum spacing and minimum rod sizes:
 - 1. 1/2-Inch NPS (DN15): Maximum span, 72 inches (1829 mm); minimum rod size, 3/8 inch (10 mm).
 - 2. 3/4- and 1-Inch NPS (DN20 and DN25): Maximum span, 96 inches (2438 mm); minimum rod size, 3/8 inch (10 mm).
 - 3. 1-1/4-Inch NPS (DN32): Maximum span, 108 inches (2743 mm); minimum rod size, 3/8 inch (10 mm).
 - 4. 1-1/2- and 2-Inch NPS (DN40 and DN50): Maximum span, 108 inches (2473 mm); minimum rod size, 3/8 inch (10 mm).
- C. Support horizontal, corrugated stainless-steel tubing according to manufacturer's written instructions.
- D. Support vertical pipe and tube at each floor.

3.08 CONNECTIONS

- A. Install gas piping next to equipment and appliances using gas to allow service and maintenance.
- B. Connect gas piping to equipment and appliances using gas with shutoff valves and unions. Install gas valve upstream from and within 72 inches (1800 mm) of each appliance using gas. Install union or flanged connection downstream from valve. Include flexible connectors when indicated.
- C. Flexible connectors shall be installed with smooth radius curves, not tight, kinked turns.
- D. Sediment Traps: Install tee fitting with capped nipple in bottom forming drip, as close as practical to inlet for appliance using gas.

3.09 ELECTRICAL BONDING AND GROUNDING

- A. Install aboveground portions of natural gas piping systems that are upstream from equipment shutoff valves, electrically continuous, and bonded to grounding electrode according to NFPA 70.
- B. Do not use gas piping as grounding electrode.

3.10 FIELD QUALITY CONTROL

- A. Inspect, test, and purge piping according to NFPA 54, Part 4 "Gas Piping Inspection, Testing, and Purging" and requirements of the Government.

- B. Repair leaks and defects with new materials and retest system until satisfactory results are obtained.
- C. Report test results promptly and in writing to Contracting Officer.
- D. Verify capacities and pressure ratings of gas regulators, valves, and specialties.
- E. Verify correct pressure settings for pressure regulators.
- F. Verify that specified piping tests are complete.

3.11 ADJUSTING

- A. Adjust controls and safety devices. Replace damaged and malfunctioning controls and safety devices.

END OF SECTION

SECTION 15671
CONDENSING UNITS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes air-cooled condensing units with the following:
 - 1. Direct-expansion cooling coils.
 - 2. Humidifiers.
 - 3. Programmable Heating/Cooling Thermostats.

1.03 SUBMITTALS

- A. Product Data: Include rated capacities; shipping, installed, and operating weights; dimensions; required clearances; methods for assembling components; furnished specialties; accessories; and installation and startup instructions for each model indicated.
- B. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.
- C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
- D. Maintenance Data: For each condensing unit to include in the maintenance manuals specified in Division 1.
 - 1. Include a parts list for each condensing unit, control, and accessory; troubleshooting maintenance guide; and servicing and preventive maintenance procedures and schedule.
- E. Warranties: Special warranties specified in this Section.

1.04 QUALITY ASSURANCE

- A. Listing and Labeling: Provide electrically operated equipment specified in this Section that is listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- B. Fabricate and label refrigeration system according to ASHRAE 15, "Safety Code for Mechanical Refrigeration."
- C. Comply with NFPA 70.
- D. Comply with UL 303, "Refrigeration and Air-Conditioning Condensing and Compressor Units."

1.05 COORDINATION

- A. Coordinate size and location of concrete housekeeping bases.

1.06 WARRANTY

- A. Special Warranty: A written warranty, executed by Contractor and signed by manufacturer, agreeing to replace components that fail in materials and workmanship within the specified warranty period, provided manufacturer's written instructions for installation, operation, and maintenance have been followed.
1. Warranty Period: Manufacturers standard, but not less than 5 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide condensing units by one of the following:
1. Condensing Units, Air Cooled, 1 to 5 Tons (3.5 to 17.6 kW):
 - a. Carrier Corp.; Carrier Air Conditioning Div.
 - b. Lennox International, Inc.; Lennox Industries, Inc. Div.
 - c. Rheem Mfg. Co.; Air Conditioning Div.
 - d. Trane Co. (The); North American Commercial Group.
 - e. York International Corp.
 2. Humidifiers:
 - a. American Metal Products Co.; Autoflo Div.
 - b. Dornback Furnace & Foundry Co.
 - c. General Filters, Inc.
 - d. Inter-City Products Corp. (USA).

- e. Lennox Industries, Inc.
- f. Research Products Corp.
- g. United Technologies Corp.; Carrier Corp. Div.
- h. Williamson Co. (The).

2.02 CONDENSING UNITS, AIR COOLED, 1 TO 5 TONS (3.5 TO 17.6 KW)

- A. Description: Factory assembled and tested, air cooled; consisting of compressors, condenser coils, fans, motors, refrigerant reservoirs, and operating controls.
- B. Compressor: Hermetically sealed and isolated for vibration.
 - 1. Motor: Include thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.
- C. Condenser: Copper-tube, aluminum-fin coil, with liquid subcooler.
- D. Condenser Fan: Direct-drive, aluminum propeller fan; with permanently lubricated fan motor with thermal-overload protection.
- E. Accessories include the following:
 - 1. Low-voltage thermostat and subbase to control condensing unit and evaporator fan.
 - 2. Precharged and insulated suction and liquid tubing.
 - 3. Automatic reset timer to prevent compressor rapid cycle.
- F. Casing: Steel, finished with baked enamel; with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Mount service valves, fittings, and gage ports on exterior of casing.

2.03 DIRECT-EXPANSION COOLING COILS AND PIPING

- A. Evaporator Coil: Conform to ARI 210/240, "Unitary Air Conditioning and Air Source Heat Pump Equipment." Match size with furnace and remote condensing unit with type, capacity, pressure-drop ratings, restricted distributor, or expansion valve. Include condensate drain pan with accessible drain outlet. Coil shall be fully cased, sized to fit to existing furnaces.
- B. Refrigerant Line Kits: Annealed-copper suction and liquid lines factory cleaned, dried, pressurized, and sealed; with insulated suction line and flared fittings at evaporator end; no fitting at condenser end; length as required.

2.04 HUMIDIFIERS

- A. Wetted-pad, continuous-drain, bypass type with bypass damper and water flow control orifice, arranged for mounting on supply duct or plenum with bypass connection to return duct, with wall-mounted humidistat, water supply and drain piping.

2.05 THERMOSTAT AND CONTROL WIRING

- A. Thermostat: 24 VAC, solid-state, programmable, microprocessor-based wall mounting unit with automatic switching from heating to cooling, preferential rate control, multiple temperature presets selectable by day and time, and battery back-up protection of program settings against power failure.
- B. Wire and Cable: Specified in Division 16 Section "Wires and Cables."

2.06 MOTORS

- A. Motor Construction: NEMA MG 1, general purpose, continuous duty, Design B.

2.07 SOURCE QUALITY CONTROL

- A. Verification of Performance: Rate condensing units and evaporator coil. According to ARI 210/240, SEER shall be minimum of 13.0.
- B. Test and inspect shell and tube condensers according to ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
- C. Testing Requirements: Factory test sound-power-level ratings according to ARI 270.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install condensing units according to manufacturer's written instructions.
- B. Install units level and plumb, firmly anchored in locations indicated; maintain manufacturer's recommended clearances.
- C. Controls: Install thermostats at mounting height of 60 inches (1500 mm) above floor.
- D. Control Wiring: Install control wiring as specified in Division 16 Section "Wires and Cables."
- E. Install humidifier on furnace plenum and ducted connection to return. Install and wire wall-mounted humidistat near thermostat. Follow manufacturers installation instructions.

- F. Install humidifier water supply (1/4" copper tubing) with shutoff and drain piping (3/4" PVC) to nearest drain.

3.02 CONNECTIONS

- A. Connect precharged refrigerant tubing to unit's quick-connect fittings. Install tubing so it does not interfere with access to unit. Install furnished accessories.
- B. Ground equipment.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.03 FIELD QUALITY CONTROL

- A. Leak Test: After installation, charge systems with refrigerant and oil and test for leaks. Repair leaks and replace lost refrigerant and oil.
- B. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation, product capability, and compliance with requirements.
 - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Remove and replace malfunctioning units with new units and retest.

3.04 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Clean units to remove dirt and construction debris and repair damaged finishes.

3.05 COMMISSIONING

- A. Verify that units are installed and connected according to the Contract Documents.
- B. Complete installation and startup checks according to manufacturer's written instructions and do the following:
 - 1. Inspect for physical damage to unit casing.
 - 2. Verify that access doors move freely and are weathertight.
 - 3. Clean units and inspect for construction debris.
 - 4. Check that all bolts and screws are tight.
 - 5. Adjust vibration isolation and flexible connections.
 - 6. Verify that controls are connected and operational.
 - 7. Start each system and operate controls.
 - 8. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
 - 9. Test functions, operations, control sequences, and protective features. Adjust to ensure operation is as specified

- C. Lubricate bearings on fans.
- D. Verify that fan wheel is rotating in the correct direction and is not vibrating or binding.
- E. Adjust fan belts to proper alignment and tension.
- F. Start unit according to manufacturer's written instructions.
 - 1. Complete manufacturer's starting checklist.
- G. Measure and record airflow over coils.
- H. Check operation of condenser capacity control device.
- I. After startup and performance test, lubricate bearings and adjust belt tension.
- J. Correct deficiencies identified by tests and observations and retest until specified requirements are met.
- K. Temporary Heat: The furnace may be used for temporary heat, during construction, with the following restrictions:
 - 1. Do not use furnace during any part of gyp board installation, finishing, or cleanup.
 - 2. Change air filter just prior to turning unit over to the Government.
 - 3. Vacuum ductwork and furnace as required in Division 15 Section "Metal Ductwork."

3.06 DEMONSTRATION

- A. Startup Services: Engage a factory-authorized service representative to train Government maintenance personnel as specified below:
 - 1. Train Government maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.
 - 2. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
 - 3. Schedule training with Contracting Officer, with at least 7 days' advance notice.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15853
POWER VENTILATORS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Ceiling-mounted exhaust fans.
- B. Products furnished, but not installed, under this Section include roof curbs for roof-mounted exhaust fans.

1.03 PERFORMANCE REQUIREMENTS

- A. Project Altitude: Base air ratings on actual site elevations.
- B. Operating Limits: Classify according to AMCA 99.
- C. Fan Unit Schedule: The following information is described in an equipment schedule on the Drawings.
 - 1. Fan performance data including capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
 - 2. Fan arrangement including wheel configuration, inlet and discharge configurations, and required accessories.

1.04 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data including rated capacities of each unit, weights (shipping, installed, and operating), furnished specialties, accessories, and the following:
 - 1. Certified fan performance curves with system operating conditions indicated.
 - 2. Certified fan sound power ratings.
 - 3. Motor ratings and electrical characteristics plus motor and electrical accessories.
 - 4. Material gages and finishes, including color charts.
 - 5. Dampers, including housings, linkages, and operators.

- C. Wiring diagrams detailing wiring for power and control systems and differentiating clearly between manufacturer-installed and field-installed wiring.
- D. Maintenance data for power ventilators to include in the operation and maintenance manual specified in Division 1 and in Division 15 Section "Basic Mechanical Requirements."

1.05 QUALITY ASSURANCE

- A. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL where available.
- B. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- C. AMCA Compliance: Provide products that meet performance requirements and are licensed to use the AMCA Seal.
- D. NEMA Compliance: Provide components required as part of fans that comply with applicable NEMA standards.
- E. UL Standard: Provide power ventilators that comply with UL 705.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Ceiling-Mounted Exhaust Fans:
 - 1. Ammerman Company, Inc.
 - 2. Broan Mfg. Co., Inc.
 - 3. Carnes Co.
 - 4. Chelsea Fans & Blowers, Inc.
 - 5. Cook (Loren) Co.
 - 6. Greenheck Fan Corp.
 - 7. Essick Air Products, Breidert.
 - 8. FloAire, Inc.
 - 9. ILG Industries, Inc.
 - 10. Jenn Industries Inc.

2.02 CEILING-MOUNTED EXHAUST FANS

- A. Description: Centrifugal fans designed for installing in ceiling.

- B. Housing: Constructed of steel and are sized to allow mounting between ceiling joists. Fan housing is acoustically insulated.
- C. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.
- D. Grille, Duct Collar, and Integral Backdraft Damper: Constructed of molded polymer.
- E. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions for compliance with requirements of installation tolerances and other conditions affecting performance of the power ventilators. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install power ventilators according to manufacturer's written instructions.
- B. Install units with clearances for service and maintenance.
- C. Label units according to requirements specified in Division 15 Section "Mechanical Identification."

3.03 CONNECTIONS

- A. Duct installation and connection requirements are specified in other Division 15 Sections. Drawings indicate the general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors.
- B. Electrical: Conform to applicable requirements in Division 16 Sections.
- C. Grounding: Ground equipment. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04 CLEANING

- A. After completing installation, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes including chips, scratches, and abrasions.
- B. Clean fan interiors to remove foreign material and construction debris. Vacuum clean fan wheel and cabinet.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15855

REGISTERS AND GRILLES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes ceiling- and wall-mounted registers and grilles.
- B. Related Sections include the following:
 - 1. Division 15 Section "Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to registers and grilles.
 - 2. Division 15 Section "Testing, Adjusting, and Balancing" for balancing diffusers, registers, and grilles.

1.03 DEFINITIONS

- A. Grille: A louvered or perforated covering for an opening in an air passage, which can be located in a sidewall, ceiling, or floor.
- B. Register: A combination grille and damper assembly over an air opening.

1.04 SUBMITTALS

- A. Product Data: For each model indicated, include the following:
 - 1. Data Sheet: For each type of air outlet and inlet, and accessory furnished; indicate construction, finish, and mounting details.
 - 2. Performance Data: Include throw and drop, static-pressure drop, and noise ratings for each type of air outlet and inlet.
 - 3. Schedule of registers and grilles indicating drawing designation, room location, quantity, model number, size, and accessories furnished.
 - 4. Assembly Drawing: For each type of air outlet and inlet; indicate materials and methods of assembly of components.
- B. Coordination Drawings: Reflected ceiling plans and wall elevations drawn to scale to show locations and coordination of registers and grilles with other items installed in ceilings and walls.

- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for registers and grilles with factory-applied color finishes.
- D. Samples for Verification: Of registers and grilles, in manufacturer's standard sizes, showing the full range of colors. Prepare Samples from the same material to be used for the Work.

1.05 QUALITY ASSURANCE

- A. NFPA Compliance: Install registers and grilles according to NFPA 90A, "Standard for the Installation of Air-Conditioning and Ventilating Systems."

PART 2 – PRODUCTS

2.01 MANUFACTURED UNITS

- A. Registers and grilles are scheduled on Drawings.

2.02 SOURCE QUALITY CONTROL

- A. Testing: Test performance according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas where registers and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install registers and grilles level and plumb, according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.
- B. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practicable. For units installed in lay-in ceiling panels, locate units in the center of the panel. Where architectural features or other items conflict with installation, notify Contracting Officer for a determination of final location.
- C. Install registers and grilles with airtight connection to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.03 ADJUSTING

- A. After installation, adjust registers and grilles to air patterns indicated, or as directed, before starting air balancing.

3.04 CLEANING

- A. After installation of registers and grilles, inspect exposed finish. Clean exposed surfaces to remove burrs, dirt, and smudges. Replace registers and grilles that have damaged finishes.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 15891
METAL DUCTWORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements of the following Division 15 Sections apply to this section:
 - 1. "Basic Mechanical Requirements."
 - 2. "Basic Mechanical Materials and Methods."

1.02 SUMMARY

- A. This Section includes rectangular, and round metal ducts and plenums for heating, ventilating, and air conditioning systems in pressure classes from minus 2 inches to plus 2 inches water gage.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Duct Accessories" for flexible duct materials, dampers, duct-mounted access panels and doors, and turning vanes.
 - 2. Division 15 Section "Registers and Grilles."
 - 3. Division 15 Section "Testing, Adjusting, and Balancing."

1.03 DEFINITIONS

- A. Sealing Requirements Definitions: For the purposes of duct systems sealing requirements specified in this Section, the following definitions apply:
 - 1. Seams: A seam is defined as joining of two longitudinally (in the direction of airflow) oriented edges of duct surface material occurring between two joints. All other duct surface connections made on the perimeter are deemed to be joints.
 - 2. Joints: Joints include girth joints; branch and subbranch intersections; so-called duct collar tap-ins; fitting subsections; louver and air terminal connections to ducts; access door and access panel frames and jambs; duct, plenum, and casing abutments to building structures.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. The duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of the air system. Changes or alterations to the layout or configuration of the duct system must be specifically approved in writing by the Contracting Officer. Accompany requests for layout modifications with calculations showing that the proposed layout will provide the original design results without increasing the system total pressure.

1.05 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data including details of construction relative to materials, dimensions of individual components, profiles, and finishes for the following items:
 - 1. Sealing Materials.
- C. Shop drawings from duct fabrication shop, drawn to a scale not smaller than 1/4 inch equals 1 foot, on drawing sheets same size as the Contract Drawings, detailing:
 - 1. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other work.
 - 2. Duct layout, indicating pressure classifications and sizes in plan view. For exhaust ducts systems, indicate the classification of the materials handled as defined in this Section.
 - 3. Fittings.
 - 4. Reinforcing details and spacing.
 - 5. Seam and joint construction details.
 - 6. Penetrations through fire-rated and other partitions.
 - 7. Hangers and supports, including methods for building attachment, vibration isolation, and duct attachment.
- D. Coordination drawings for ductwork installation in accordance with Division 15 Section "Basic Mechanical Requirements." In addition to the requirements specified in "Basic Mechanical Requirements" show the following:
 - 1. Spatial coordination with other systems installed in the same space with the duct systems.
 - 2. Coordination with ceiling-mounted lighting fixtures and air outlets and inlets.
- E. Welding certificates including welding procedures specifications, welding procedures qualifications test records, and welders' qualifications test records complying with requirements specified in "Quality Assurance" below.

- F. Record drawings including duct systems routing, fittings details, reinforcing, support, and installed accessories and devices, in accordance with Division 15 Section "Basic Mechanical Requirements" and Division 1.

1.06 QUALITY ASSURANCE

- A. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code"
- B. Steel" for hangers and supports and AWS D9.1 "Sheet Metal Welding Code."
- C. Qualify each welder in accordance with AWS qualification tests for welding processes involved. Certify that their qualification is current.
- D. NFPA Compliance: Comply with the following NFPA Standards:
 - 1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sealant and fire-stopping materials to site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle sealant fire-stopping materials in compliance with manufacturers' recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.
- C. Deliver and store stainless steel sheets with mill-applied adhesive protective paper, maintained through fabrication and installation.

PART 2 – PRODUCTS

2.01 SHEET METAL MATERIALS

- A. Sheet Metal, General: Provide sheet metal in thicknesses indicated, packaged and marked as specified in ASTM A 700.
- B. Galvanized Sheet Steel: Lock-forming quality, ASTM A 527, Coating Designation G 90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.
- C. Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts.

2.02 SEALING MATERIALS

- A. Joint and Seam Sealants, General: The term sealant used here is not limited to materials of adhesive or mastic nature, but also includes tapes and combinations of open weave fabric strips and mastics.
- B. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.
- C. Duct tape shall not be used.

2.03 HANGERS AND SUPPORTS

- A. Building Attachments: Wood screws and nails (used in pairs).
- B. Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.
 - 1. Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards, 1985 Edition, for sheet steel width and gage and steel rod diameters.
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.
 - 1. Where galvanized steel ducts are installed, provide hot-dipped-galvanized steel shapes and plates.

2.04 RECTANGULAR DUCT FABRICATION

- A. General: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.
 - 1. Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
 - 2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
- B. Static Pressure Classifications: Except where otherwise indicated, construct duct systems to the following pressure classifications:
 - 1. Supply Ducts: 2 inches water gage.
 - 2. Return Ducts: 2 inches water gage, negative pressure.

3. Exhaust Ducts: 2 inches water gage, negative pressure.
- C. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are lined or are externally insulated.

2.05 RECTANGULAR DUCT FITTINGS

- A. Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," 1985 Edition, Figures 2-1 through 2-10.

2.06 ROUND DUCT FABRICATION

- A. Round Ducts: Fabricate round supply ducts using seam types identified in SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figure 3-1, RL-1, RL-4, or RL-5. Seams Types RL-2 or RL-3 may be used if spot-welded on 1-inch intervals. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.

2.07 ROUND SUPPLY AND EXHAUST FITTINGS FABRICATION

- A. 90-Degree Tees and Laterals and Conical Tees: Fabricate to conform to SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figures 3-4 and 3-5 and with metal thicknesses specified for longitudinal seam straight duct.
- B. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from the body onto branch tap entrance.
- C. Elbows: Fabricate in die-formed, gored, pleated, or mitered construction. Fabricate the bend radius of die-formed, gored, and pleated elbows 1.5 times the elbow diameter. Unless elbow construction type is indicated, provide elbows meeting the following requirements:
 1. Mitered Elbows: Fabricate mitered elbows with welded construction in gages specified below.
 - a. Mitered Elbows Radius and Number of Pieces: Unless otherwise indicated, construct elbow to comply with SMACNA "HVAC Duct Construction Standards," Table 3-1.
 - b. Round Mitered Elbows: Solid welded and with metal thickness listed below for pressure classes from minus 2 inches to plus 2 inches:
 - 1) 3 to 26 inches: 24 gage.

- c. 90-Degree, 2-Piece, Mitered Elbows: Use only for supply systems, and only where space restrictions do not permit the use of 1.5 bend radius elbows. Fabricate with a single-thickness turning vanes.
- 2. Round Elbows
- 3. 8 Inches and Smaller: Die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend angle configurations or 1/2-inch-diameter (e.g. 3-1/2- and 4-1/2-inch) elbows with gored construction.
- 4. Die-Formed Elbows for Sizes Through 8 Inches and All Pressures: 20 gage with 2-piece welded construction.
- 5. Round Gored Elbows Gages: Same as for nonelbow fittings specified above.
- 6. Same as longitudinal seam flat oval duct.

PART 3 – EXECUTION

3.01 DUCT INSTALLATION, GENERAL

- A. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.
- B. Install ducts with the fewest possible joints.
- C. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.
- D. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.
- E. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.
- F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- G. Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.
- H. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
- I. Coordinate layout with lighting layouts and similar finished work.

3.02 SEAM AND JOINT SEALING

- A. General: Seal duct seams and joints as follows:
- B. Pressure Classification Less than 2 Inches Water Gage: Transverse joints only.

3.03 HANGING AND SUPPORTING

- A. Install rigid round and rectangular metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.
- B. Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.
- C. Support vertical ducts at a maximum interval of 16 feet and at each floor.
- D. Upper attachments to structures shall have an allowable load not exceeding 1/4 of the failure (proof test) load but are not limited to the specific methods indicated.

3.04 CONNECTIONS

- A. Equipment Connections: Connect equipment with flexible connectors in accordance with Division 15 Section "Duct Accessories."
- B. Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.
- C. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.

3.05 FIELD QUALITY CONTROL

- A. Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.

3.06 ADJUSTING AND CLEANING

- A. Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 15 Section "TESTING, ADJUSTING, AND BALANCING" for requirements and procedures for adjusting and balancing air systems.

- B. Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION

SECTION 15910
DUCT ACCESSORIES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Manual volume control dampers.
 - 2. Duct-mounted access doors and panels.
 - 3. Flexible connectors.
 - 4. Accessories hardware.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 15 Section "Air Outlets and Inlets" for diffusers, registers, and grilles.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data including details for materials, dimensions of individual components, profiles, and finishes for the following items:
 - 1. Manual volume control dampers.
 - 2. Duct-mounted access panels and doors.
 - 3. Flexible ducts.

1.04 QUALITY ASSURANCE

- A. NFPA Compliance: Comply with the following NFPA Standards:
 - 1. NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems."

2. NFPA 90B, "Standard for the Installation of Warm Air Heating and Air Conditioning Systems."

PART 2 – PRODUCTS

2.01 MANUAL VOLUME CONTROL DAMPERS

- A. General: Provide factory-fabricated volume-control dampers, complete with required hardware and accessories. Stiffen damper blades to provide stability under operating conditions. Provide locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class. Extend axles full length of damper blades. Provide bearings at both ends of operating shaft.
- B. Standard Volume Control Dampers: Multiple- or single-blade, or opposed-blade design, standard leakage rating, and suitable for horizontal or vertical applications.
 1. Steel Frames: Hat-shaped, galvanized-steel channels, minimum of 16 gage (1.6 mm), and with mitered and welded corners. Provide frames with flanges where indicated for attaching to walls. Provide flangeless frames where indicated for installation in ducts.
 2. Roll-Formed Steel Blades: 16-gage (1.6-mm) galvanized steel.
 3. Blade Axles: Galvanized steel.
 4. Tie Bars and Brackets: Galvanized steel.

2.02 DUCT-MOUNTED ACCESS DOORS AND PANELS

- A. General: Refer to the Access Door Materials Schedule at the end of this Section for frame and door thickness, number of hinges and locks, and location of locks. Provide construction and airtightness suitable for duct pressure class.
- B. Frame: Galvanized sheet steel. Provide with bend-over tabs and foam gaskets.
- C. Door: Galvanized sheet metal construction, number of hinges and locks as indicated for duct pressure class. Provide 1-inch by 1-inch (25-mm by 25-mm) butt hinge or piano hinge and cam latches.
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber seals.

2.03 FLEXIBLE CONNECTORS

- A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL Standard 181, Class 1.

- B. Standard Metal-Edged Connectors: Factory-fabricated with a strip of fabric 3-1/2 inches (89 mm) wide attached to 2 strips of 2-3/4-inch-wide (70-mm-wide), 24-gage (0.7-mm), galvanized sheet steel or 0.032-inch (0.8-mm) aluminum sheets. Select metal compatible with connected duct system. Fold and crimp metal edge strips onto fabric as illustrated in SMACNA HVAC Duct Standard, 1st Edition, Figure 2-19.

2.04 FLEXIBLE DUCTS

- A. General: Comply with UL 181, Class 1.

2.05 ACCESSORIES HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket and a flat mounting gasket. Size to allow insertion of pitot tube and other testing instruments.
- B. Splitter Damper Accessories: Zinc-plated damper blade bracket, 1/4-inch (6-mm), zinc-plated operating rod, and a duct-mounted, ball-joint bracket with flat rubber gasket and square-head set screw.
- C. Flexible Duct Clamps: Stainless steel band with cadmium-plated hex screw to tighten band with a worm-gear action. Provide in sizes from 3 to 18 inches (75 to 450 mm) to suit duct size.
- D. Adhesives: High strength, quick setting, neoprene based, waterproof and resistant to gasoline and grease.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of duct accessories. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Install duct accessories according to manufacturer's installation instructions and applicable portions of details of construction as shown in SMACNA standards.
- B. Provide test holes at furnace inlet and outlet and elsewhere as indicated.

3.03 ADJUSTING

- A. Adjust duct accessories for proper settings.
- B. Final positioning of manual dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

3.04 ACCESS DOOR MATERIALS SCHEDULE

DUCT PRESSUR E CLASS	DOOR SIZE INCHES	NUMBE R OF HINGES	NUMBER OF LOCKS	METAL GAGE		
				FRAM E	DOO R	BACK
2 INCHES OR LESS	12X12	2	1-S	24	26	26
	16x20	2	2-S	22	24	26
	24X24	3	2-S	22	22	26

DUCT PRESSUR E CLASS	DOOR SIZE mm	NUMBE R OF HINGES	NUMBER OF LOCKS	METAL mm		
				FRAM E	DOO R	BACK
500 PA & LESS	300X300	2	1-S	0.7	0.55	0.55
	400X500	2	2-S	0.85	0.7	0.55
	600X600	3	2-S	0.85	0.85	0.55

S: SIDE
T: TOP
B: BOTTO
M

END OF SECTION

SECTION 15990

TESTING, ADJUSTING, AND BALANCING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes testing, adjusting, and balancing HVAC systems in the prototype units to produce design objectives, including the following:
 - 1. Balancing airflow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.
 - 2. Adjusting total HVAC systems to provide indicated quantities.
 - 3. Measuring electrical performance of HVAC equipment.
 - 4. Setting quantitative performance of HVAC equipment.
 - 5. Verifying that automatic control devices are functioning properly.
 - 6. Reporting results of the activities and procedures specified in this Section.
 - 7. Adjusting systems in all units to correct deficiencies identified in tests of prototype units.
- B. Related Sections include the following:
 - 1. Testing and adjusting requirements unique to particular systems and equipment are included in the Sections that specify those systems and equipment.
 - 2. Field quality-control testing to verify that workmanship quality for system and equipment installation is specified in system and equipment Sections.

1.03 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.
- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

- D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.
- E. Report Forms: Test data sheets for recording test data in logical order.
- F. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- G. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- H. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

1.04 QUALITY ASSURANCE

- A. Testing, Adjusting, and Balancing Reports: Use testing, adjusting, and balancing Agent's standard forms approved by the Contracting Officer, for the prototype units.

1.05 COORDINATION

- A. Notice: Provide 7 days' advance notice for testing of prototype units. Include scheduled test dates and times.
- B. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

PART 2 – PRODUCTS

Not Applicable

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.
 - 1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.

2. Verify that balancing devices, such as test ports and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
- D. Examine system and equipment test reports.
- E. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports and manual volume dampers, are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- F. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.
- G. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- H. Examine equipment for installation and for properly operating safety interlocks and controls.
- I. Examine automatic temperature system components to verify the following:
 1. Thermostats are located to avoid adverse effects of sunlight, drafts, and cold walls.
- J. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.02 PREPARATION

- A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures for prototype units.
- B. Complete system readiness checks and prepare system readiness reports. Verify the following:
 1. Automatic temperature-control systems are operational.
 2. Equipment and duct access doors are securely closed.
 3. Balance dampers are open.

4. Windows and doors can be closed so design conditions for system operations can be met.

3.03 GENERAL TESTING AND BALANCING PROCEDURES

- A. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.04 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Check dampers for proper position to achieve desired airflow path.
- C. Check for airflow blockages.
- D. Check condensate drains for proper connections and functioning.
- E. Check for proper sealing of air-handling unit components.

3.05 CONDENSING UNITS

- A. Verify proper rotation of fans and measure entering- and leaving-air temperatures. Record compressor data.

3.06 TEMPERATURE TESTING

- A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.
- B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of 2 successive 8-hour days, in each separately controlled zone, to prove correctness of final temperature settings.
- C. Measure outside-air, wet- and dry-bulb temperatures.

3.07 TOLERANCES

- A. Set HVAC system airflow and water flow rates within the following tolerances:
 1. Supply, Return, and Exhaust Fans: Plus 5 to plus 10 percent.
 2. Air Outlets and Inlets: 0 to minus 10 percent.

3.08 FINAL REPORT

- A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
- B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing agent.
 - 1. Include a list of the instruments used for procedures, along with proof of calibration.
- C. Final Report Contents: In addition to the certified field report data, include the following:
 - 1. Fan curves.
 - 2. Manufacturers' test data.
 - 3. Field test reports prepared by system and equipment installers.
 - 4. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.
- D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:
 - 1. Title page.
 - 2. Name and address of testing, adjusting, and balancing Agent.
 - 3. Project name.
 - 4. Project location.
 - 5. Architect's name and address.
 - 6. Contractor's name and address.
 - 7. Report date.
 - 8. Signature of testing, adjusting, and balancing Agent who certifies the report.
 - 9. Summary of contents, including the following:
 - a. Design versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes limited scope general construction materials and methods for application with electrical installations as follows:
 - 1. Miscellaneous metals for support of electrical materials and equipment.
 - 2. Miscellaneous lumber.
 - 3. Fasteners, and anchorage for support of electrical materials and equipment.
 - 4. Joint sealers for sealing around electrical materials and equipment; and for sealing penetrations in fire and smoke barriers, floors, and foundation walls.
- B. Related Sections:
 - 1. Section 06100 – Rough Carpentry.
 - 2. Section 06200 – Finish Carpentry.
 - 3. Section 07900 – Joint Sealers.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for the following products:
 - 1. Joint sealers.
- C. Shop drawings detailing supports, anchorage, and fabrication and installation for metal fabrications, electrical materials and equipment.
- D. Welder certificates, signed by Contractor, certifying that welders comply with requirements specified under "Quality Assurance" article of this Section.

- E. Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of services, and details for dust and noise control.

- 1. Coordinate per Division 1 Section "SUMMARY OF WORK."

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer for the installation and application of joint sealers.
- B. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code – Steel."
- C. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.
- D. All electrical work is to be performed under the supervision of a licensed Master Electrician.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver joint sealer materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle joint sealer materials in compliance with the manufacturers' recommendations to prevent their deterioration and damage.

PART 2 – PRODUCTS

2.01 MISCELLANEOUS METALS

- A. Steel plates, shapes, bars, and bar grating: ASTM A 36.
- B. Cold-Formed Steel Tubing: ASTM A 500.
- C. Hot-Rolled Steel Tubing: ASTM A 501.
- D. Steel Pipe: ASTM A 53, Schedule 40, welded.
- E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, recommended for interior and exterior applications.
- F. Fasteners: Zinc-coated, type, grade, and class as required unless indicated otherwise.

2.02 MISCELLANEOUS LUMBER

- A. Framing Materials: Standard Grade, light-framing-size lumber of any species. Number 3 Common or Standard Grade boards complying with WCLIB or AWPA rules, or Number 3 boards complying with SPIB rules. Lumber shall be preservative treated in accordance with AWPB LP-2, and kiln dried to a moisture content of not more than 19 percent.
- B. Construction panels, equipment backboards, and terminal boards, plywood panels; APA C-D PLUGGED INT, with exterior glue; 1-inch thick dimension as indicated, painted grey per Division.
- C. The requirements of Division 6 "Wood and Plastics" apply and were more stringent, supersede this section.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of joint sealers and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."
- C. Cut, fit, and place anchorage accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- D. Select fastener sizes that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members.
- E. Attach to substrates as required to support applied loads.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16110

RACEWAYS AND FITTINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes raceways and fittings for electrical wiring. Types of raceways and fittings in this section include the following:
 - 1. Electrical metallic tubing (EMT) and fittings.
 - 2. Flexible metal conduit and fittings.
 - 3. Liquidtight flexible conduit and fittings.
 - 4. Rigid metal conduit (GRC) and fittings.
 - 5. Rigid nonmetallic conduit (PVC) and fittings.
 - 6. Surface raceways and fittings.
 - 7. Wireway and fittings.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data for the following products:
 - 1. EMT, flexible metal conduit, liquidtight flexible conduit, GRC, PVC, and fittings.
 - 2. Surface raceways and fittings.
 - 3. Wireway and fittings.
- C. Use and area of use of flexible conduit.

1.04 QUALITY ASSURANCE

- A. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."
- B. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways and fittings.

- C. UL Compliance and Labeling: Comply with applicable requirements of UL standards pertaining to electrical raceways and fittings. Provide raceway products, components, and fittings listed and labeled by UL.

1.05 SEQUENCING AND SCHEDULING

- A. Coordinate with other Work as necessary to interface installation of electrical raceways and components with other Work.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Conduit Bodies, Covers, and Gaskets:
 - a. Appleton Electric Company.
 - b. Carlon.
 - c. Crouse-Hinds Division, Cooper Industries, Incorporated.
 - 2. Electrical Metallic Tubing (EMT):
 - a. Allied Tube and Conduit.
 - b. Triangle.
 - c. Wheatland Tube Company.
 - 3. Flexible Metal Conduit:
 - a. Alflec Corporation.
 - b. Electri-Flex Company.
 - c. International Metal Hose Incorporated.
 - 4. Liquidtight Flexible Conduit:
 - a. Ancanda.
 - b. Electri-Flex Company.
 - c. Carol Cable Company, Incorporated.
 - 5. Rigid Metal Conduit (GRC):
 - a. Allied Tube and Conduit.
 - b. Triangle.
 - c. Wheatland Tube Company.

6. Rigid Nonmetallic Conduit (PVC):
 - a. Cantex Industries.
 - b. Carlon.
 - c. Certainteed Product Corporation.
7. Electrical Metallic Tubing (EMT) Fittings:
 - a. American Electric (Steel City).
 - b. Midwest Electric, Division of Cooper Industries, Incorporated.
 - c. Raco, Incorporated.
8. Flexible Metal Conduit Fittings:
 - a. Midwest Electric, Division of Cooper Industries, Incorporated.
 - b. Oz/Gedney Company.
 - c. Thomas and Betts Corporation.
9. Liquidtight Flexible Conduit Fittings:
 - a. Midwest Electric, Division of Cooper Industries, Incorporated.
 - b. Oz/Gedney Company.
 - c. Thomas and Betts Corporation.
10. Rigid Metal Conduit Fittings:
 - a. American Electric (Steel City).
 - b. Midwest Electric, Division of Cooper Industries, Incorporated.
 - c. Raco, Incorporated.
11. Rigid Nonmetallic Conduit Fittings:
 - a. Cantex Industries.
 - b. Carlon.
 - c. Certainteed Products Corporation.
12. Wireway:
 - a. Hoffman Engineering Company.
 - b. Robroy Industries, Incorporated.
 - c. Square D Company.

2.02 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit (GRC): ANSI C80.1.
- B. Electrical Metallic Tubing and Fittings (EMT): ANSI C80.3.
- C. Flexible Metal Conduit: UL 1, zinc-coated steel.
- D. Liquidtight Flexible Metal Conduit and Fittings: UL 360. Fittings shall be specifically approved for use with this raceway.

2.03 NONMETALLIC CONDUIT AND DUCTS

- A. Rigid Nonmetallic Conduit (PVC): NEMA TC 2 and UL 651, Schedule 40 PVC.
- B. PVC Conduit Fittings: NEMA TC 3; match to conduit type and material.
- C. Underground PVC: NEMA TC 6, Type I for encased burial in concrete, Type II for direct burial. Also rated for use with 90 degree C conductors under all installation conditions.
- D. PVC: NEMA TC 9; match to duct type and material.
- E. Conduit, Tubing, and Duct Accessories: Types, sizes, and materials complying with manufacturer's published product information. Mate and match accessories with raceway.

2.04 CONDUIT BODIES

- A. General: Types, shapes, and sizes as required to suit individual applications and NEC requirements. Provide matching gasketed covers secured with corrosion-resistant screws.
- B. Metallic Conduit: Use metallic conduit bodies. Use bodies with threaded hubs.
- C. Metallic Tubing (EMT) Conduit Bodies 1 Inch and Smaller: Use bodies with set screw or compression type connectors. Refer to requirements for EMT connectors for type of connector required.
- D. Nonmetallic Conduit: Use nonmetallic conduit bodies conforming to UL 514 B.

PART 3 – EXECUTION

3.01 WIRING METHOD

- A. Outdoors: Use the following wiring methods:
 - 1. Exposed: PVC unless indicated otherwise.
 - 2. Concealed: PVC unless indicated otherwise.
- B. Indoors: Use the following wiring methods:
 - 1. Exposed: EMT below ceiling. Nonmetallic sheathed cable unless indicated otherwise for all other locations.
 - 2. Concealed: Nonmetallic sheathed cable unless indicated otherwise.
 - 3. Wet Locations: PVC unless indicated otherwise.
 - 4. Damp Locations: PVC unless indicated otherwise.
- C. Exposed to 8'-0" above floor: EMT.
- D. Under Slabs on Grade: Concrete encased PVC unless indicated otherwise. Raceways shall not be installed in slabs on grade.
- E. In Slabs Not on Grade: PVC unless indicated otherwise.

- F. Underground: PVC unless indicated otherwise.
- G. Underground and service: Underground Service Entrance cable in PVC unless indicated otherwise.
- H. Under vehicular traffic areas and extending 5 feet beyond: Concrete encased PVC unless indicated otherwise.
- I. Through footers and bearing walls: Concrete encased PVC.
- J. Size: As required by NEC, 1/2 inch minimum.
- K. PVC: GRC or PVC if appropriately lubricated, offsets, bends, and elbows on larger than 2 inches unless indicated otherwise.
- L. Provide raceways sized per National Electrical Code requirements, unless indicated to be larger.
- M. Provide raceways as required. All raceways required are not necessarily indicated.

3.02 INSTALLATION

- A. General: Install electrical raceways in accordance with manufacturer's written installation instructions, applicable requirements, and as indicated.
- B. Conceal raceways, unless indicated otherwise. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot water pipes. Install raceways level and square and at proper elevations. Raceway layout is only schematic. Exact location of raceways shall be coordinated during construction with building structure and other work.
- C. Elevation of Raceway: Where possible, install horizontal raceway runs above piping and duct work.
- D. Complete installation of electrical raceways before starting installation of conductors within raceways.
- E. Provide supports for raceways as indicated and per National Electrical Code. Tie wire, tie wraps, and similar supports are not acceptable.
- F. Prevent foreign matter from entering raceways by using temporary closure protection.
- G. Protect stub-ups from damage where raceways rise from floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- H. Make bends and offsets so the inside diameter is not effectively reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
- I. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location.
 - 1. EMT: Steel set screw fitting except steel compression fittings for damp, wet, and in slab locations.
 - 2. GRC: Steel threaded fittings unless indicated otherwise.

- J. Provide bushing of the following types:
1. Plastic Bushings: At location required to have a bushing installed per NEC, and on all raceways 2 inches and larger.
 2. Metal Insulated Grounding Bushing: At location that metallic raceways are not electrically bonded by terminating fittings to the enclosure the raceways terminate at.
- K. Run concealed raceways using the following wiring methods:
1. Concealed in accessible locations: Install raceway parallel and perpendicular to nearby surfaces or structural members and follow the surface contours.
 2. Underground, and non-accessible locations: Install a minimum of bends in the shortest practical distance considering the type of building construction and obstructions except as otherwise indicated.
- L. Where NM cable is to be run exposed, it shall be run in conduit of a suitable size when below ceiling for vertical part of the run, except as may be allowed elsewhere in this specification or as noted on the drawings.
- M. Install exposed raceways parallel and perpendicular to nearby surfaces or structural members and follow the surface contours.
- N. Run exposed, parallel, or banked raceways together. Make bends in parallel or banked runs from the same center line so that the bends are parallel. Factory elbows may be used in banked runs only where they can be installed parallel. This requires that there be a change in the plane of the run such as from wall to ceiling and that the raceways be of the same size. In other cases provide field bends for parallel raceways.
- O. Terminations: Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. Where terminations cannot be made secure with one locknut, use two locknuts, one inside and one outside the box.
- P. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
- Q. Install pull line in empty raceways. Provide nylon line having not less than 200-pound tensile strength. Leave not less than 12 inches of slack at each end of the pull line. Identify each pull line.
- R. Install raceway sealing fittings in accordance with the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and as indicated otherwise:
1. Where raceways pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
 2. As required by the NEC.
- S. Flexible Connections: Use short length (maximum of 6 feet) of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for all motors, transformers, HVAC equipment and devices, and plumbing equipment and devices, except where type NM cable is allowed and used indoors. Use liquidtight flexible conduit outdoors, or in wet, or humid, or

moist locations, or corrosive atmosphere locations, or locations subject to water spray or dripping oil, grease, or water.

- T. Raceway Caps: Install caps on all spare raceways. Caps shall match and mate with the raceway installed on.
- U. Expansion/Deflection Fittings: Install in accordance with the manufacturer's written instructions. Locate fittings at expansion and/or deflection joints. Verify location of expansion and/or deflection joints on structural and architectural drawings.
- V. Fire Seal Fittings: Install in accordance with the manufacturer's written instructions. Locate seals at locations raceways, wires, cables, and electrical items pass through fire rated walls, floors, ceilings, partitions, and assemblies. Maintain fire rating of walls, floors, ceilings, partitions, and assemblies.
- W. Wall, Floor and Roof Penetration Fittings: Install in accordance with the manufacturer's written instruction unless indicated otherwise. Provide type that is compatible with material to be penetrated unless indicated otherwise.
- X. Install raceway through metal studs using prepunched holes. Field installation of holes in studs shall be approved by the Contracting Officer.

3.03 ADJUSTING AND CLEANING

- A. Upon completion of installation of raceways, clean interiors of raceways; clear all blockages and remove burrs, dirt, and construction debris.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16119

UNDERGROUND DUCTS AND TRANSFORMER BOXES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.
- C. The following sections contain requirements that relate to this Section:
 - 1. Division 2 Section "EARTHWORK" for general requirements for excavation, backfill and related items for ducts.
 - 2. Division 3 Section "CAST-IN-PLACE CONCRETE" for cast-in-place concrete requirements.

1.02 SUMMARY

- A. This section includes underground electrical work including the following:
 - 1. Ducts.
 - 2. Duct banks.
 - 3. Transformer boxes.

1.03 DEFINITIONS

- A. Duct: The general term for electrical raceway, either metallic or nonmetallic, specified for use underground, embedded in earth or concrete.
- B. Duct Bank: A group of 2 or more ducts in a continuous run between 2 points.

1.04 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for duct, duct bank materials, and miscellaneous components. Include:
 - 1. Ducts and fittings.
 - 2. Duct supports.
- C. Coordination drawings showing duct profiles and coordination with other utilities and underground structures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver ducts to site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

1.06 SEQUENCING AND SCHEDULING

- A. Coordination of the Work: Coordinate elevations of duct entrances into manholes with final profiles of conduits as determined by coordination with other utilities and underground obstructions. Revise locations and elevations from those indicated as required to suit field conditions and assure duct runs drain to manholes and as approved by the Contracting Officer.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include but are not limited to the following:
 - 1. Nonmetallic Ducts:
 - a. Cantex Industries.
 - b. Carlon.
 - c. Certainteed Products Corporation.
 - 2. Metallic Ducts:
 - a. Allied Tube and Conduit.
 - b. Triangle.
 - c. Wheatland Tube Company.
 - 3. Transformer Box Pads:
 - a. Nordic Fiberglass.
 - b. Kearney.
 - 4. Looping Pedestal:
 - a. Nordic Fiberglass.
 - b. Kearney.

2.02 DUCTS AND FITTINGS

- A. General: Ducts and duct fittings and accessories for which listing has been obtained by one or more manufacturers shall be UL listed and labeled.
- B. Galvanized Rigid Steel Conduit (GRC): ANSI C80.1.

- C. Rigid Nonmetallic Conduit (PVC): NEMA TC 1 and UL 651, Schedule 40 or 80, PVC, rated for use with 90 degree C conductors under all installation conditions.
- D. PVC Conduit Fittings: NEMA TC 3; match to conduit type and material.

2.03 CAST-IN-PLACE CONCRETE

- A. Conform to Division 3 Section "CAST-IN-PLACE CONCRETE" for concrete and reinforcing.
- B. Aggregate For Duct Encasement: 3/8 inch maximum size.
- C. Strength: 4,000 psi minimum 28 day compressive strength.

2.04 DUCT BANK ACCESSORIES

- A. Duct Supports: Rigid PVC spacers selected to provide minimum duct spacings and concrete cover depths indicated, while rigidly supporting ducts during concreting.

2.05 DUCT SEALING COMPOUND

- A. Compound: Nonhardening, putty-like consistency workable at temperatures as low as 35 degrees F. Compound shall not slump at a temperature of 300 degrees F and shall readily adhere to clean surfaces of plastic ducts, metallic conduits conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and the common metals. Compound shall have no injurious effect on workers' hands or materials.

2.06 TRANSFORMER BOX PADS

- A. Resin is to be a neat polyester thermosetting resin and not a destressed polyester thermosetting resin. The material shall be tested for flammability under ASTM-D635 with a rating to be self-extinguishing and with an extent of burning not to be over 12mm nor average time burning to be over eighty seconds on test.
- B. Fiberglass used will be a combination of chopped glass with a minimum of one layer throughout of 18 ounce woven roving so as to form a continuous filament from top to bottom and from one side to the other for maximum strength. The overall laminate thickness shall be a minimum of 1/4".
- C. The exterior surface shall be coated with a polyester base gelcoat or surfacecoat that will provide maximum protection from UV light and weathering.
- D. Transformer box pads shall be manufactured in one piece and designed to nest within six inches of each other for suitable handling and storage. The base shall have a flange measuring a minimum of 3 1/2" to provide a stable base when the transformer box pads are installed. Edge rounding between the top surface and sidewalls shall have a radius of not less than one-quarter inch nor more than one-half inch. The box pad should have no rough or sharp edges that might be harmful to cables.

- E. The transformer box pads should be designed to withstand a drop of five feet during handling and hard blows from a one pound hammer without significant damage.
- F. Transformer box pads to be furnished with 3/8" stainless steel bolt inserts for the installation of a box cover.

2.07 TRANSFORMER BOX PAD COVER

- A. The cover is fabricated of one layer of 1/2" CDX exterior plywood encapsulated in fiberglass, using fire-retardant polyester resin and chopped glass. Four brass penta-head recesses are installed for securing the cover to the box pad. Covers to come with four 3/8" x 1-1/2" stainless steel penta-head bolts.
- B. The exterior is to be completely covered with gel-coat for superior weather-ability and protection from ultraviolet light. The color is to be Munsell green. The word "ELECTRIC" shall be printed on the cover.

The cover is to be certified tested at 4,000 pounds on a 6" square area in the center of the cover with no failure when mounted on an installed box.

2.08 TRANSFORMER DEFERRAL BRACKETS

- A. Transformer deferral brackets are to be fabricated of 10 gauge steel. They are to be painted and come with stainless steel mounting hardware. They shall be suitable for mounting in the transformer box pad used. The bracket to have a parking stand for use with a portable feedthrough.

2.09 15 KV LOOPING PEDESTAL

- A. Resin is to be a neat polyester thermosetting resin and not a distressed polyester thermosetting resin. The material shall be tested for flammability under ASTM-D635 with a rating to be self-extinguishing and with an extent of burning not to be over 12mm nor average time burning to be eighty seconds on test.
- B. Fiberglass used will be a combination of chopped glass with a minimum of one layer throughout of 18 ounce woven roving so as to form a continuous filament from top to bottom and from one side to the other for maximum strength. The overall laminate thickness shall be a minimum of 1/4".
- C. The exterior surface shall be coated with a polyester base gelcoat or surfacecoat that will provide maximum protection from UV light and weathering.
- D. Looping Pedistals shall be manufactured in one piece and designed to nest within six inches of each other for suitable handling and storage. The base shall have a flange measuring a minimum of 5" to provide a stable base when the Looping Pedistals pads are installed. The pedestal should have no rough or sharp edges that might be harmful to cables.
- E. The looping pedestals should be designed to withstand a drop of five feet during handling and hard blows from a one pound hammer without significant damage.
- F. The unit dimensions should be 30" long x 8" deep x 30" wide.

PART 3 – EXECUTION

3.01 WIRING METHOD

- A. PVC unless indicated otherwise.
- B. Under slabs on Grade: Concrete encased PVC unless indicated otherwise. Ducts shall not be installed in slabs on grade.
- C. Utility and Services: Direct bury PVC unless indicated otherwise.
- D. Under vehicular traffic areas, paved areas, and extending 5 feet beyond: Concrete encased PVC unless indicated otherwise.
- E. Through footers and bearing walls: Concrete encased PVC.
- F. Size: As required by NEC, 3/4 inch minimum.
- G. PVC: GRC offsets, bends, and elbows on larger than 2 inches, unless indicated otherwise.
- H. Provide ducts sized per National Electrical Code requirements, unless indicated to be larger.
- I. Provide ducts as required. All ducts required are not necessarily indicated.

3.02 EXCAVATION AND BACKFILL

- A. Excavation and Backfill: Conform to Division 2 Section "EARTHWORK," except heavy-duty, hydraulic-operated compaction equipment shall not be used and trenching for ducts shall conform to the following:
 - 1. Excavation: Cut trenches neatly and uniformly, and slope uniformly to required pitch.
 - 2. For direct-buried, nonencased ducts prepare trench bottoms free from stones, soft spots, and sharp objects. Where necessary, add a 3-inch layer of stone-free sand to trench bottom and compact to density of adjacent undisturbed soil to provide suitable bearing for ducts. Backfill over and around ducts on bottom of trench with stone-free sand to 6 inches minimum above tops of ducts and compact by hand or pneumatic tamper to density of adjacent undisturbed earth.
 - 3. For each additional layer of direct-buried ducts above bottom ducts, backfill over and around each layer of ducts with stone-free sand or earth to 12 inches minimum above tops of ducts and compact by hand or pneumatically to density of adjacent undisturbed earth.
 - 4. Separation Between Direct-Buried, Nonencased Ducts: 3 inches minimum for like services, and 12 inches minimum between power and signal ducts.
 - 5. Backfill over electrical ducts a minimum of 12 inches prior to installation of any communications conductors or duct. All other requirements of compaction, density, etc. described above, apply.

3.03 INSTALLATION OF DUCTS

- A. General: Install electrical ducts in accordance with manufacturer's written installation instructions, applicable requirements, and as indicated.
- B. Slope: Pitch ducts to drain towards manholes and handholes and away from buildings and equipment as practical as determined by the Contracting Officer. Minimum slope shall be 4 inches in 100 feet. Where necessary to achieve this between manholes, and handholes slope ducts from a high point in the run to drain in both directions. Drive stakes in the bottom of the trench at 6 feet intervals maximum, and use to establish slope.
- C. Curves and Bends: Use manufactured long sweep elbows and bends for utility and service ducts.
- D. Joints in ducts and fittings shall be made up watertight in accordance with manufacturer's instructions. Couplings shall be staggered so those of adjacent ducts do not lie in the same plane. All PVC duct joints are to be glued in accordance with manufacturer's recommendations.
- E. Duct Entrances to Buildings: Install in accordance with the following:
 - 1. Concrete-Encased Ducts: Install reinforcing in duct banks through disturbed earth near buildings and excavations and coordinate duct bank with structural design at wall so duct bank is supported at wall without reducing structural or watertight integrity.
 - 2. Direct-Buried, Nonencased Duct Entering Nonwaterproofed Walls: Install a schedule 40 galvanized steel pipe sleeve for each duct. Caulk space between GRC and sleeve with duct sealing compound on both sides for moisture-tight seal.
 - 3. Waterproof Entrances: Where ducts enter buildings through a waterproofed floor or wall, a watertight entrance-sealing device shall be installed with the sealing gland assembly on the inside. The device shall be securely anchored into the masonry construction with one or more integral flanges and the membrane waterproofing secured to the device in a permanently watertight manner.
- F. Concrete-Encased Nonmetallic Ducts: Support on plastic separators coordinated with duct size and required duct spacing, and install in accordance with the following:
 - 1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, and secure separators to the earth and to ducts to prevent floating during concreting. Do not use tie wires or reinforcing steel in such a way as to form conductive or magnetic loops around ducts or duct groups.
 - 2. Concreting: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not use power-driven agitating equipment unless specifically designed for duct bank application. Pour each run of envelope between manholes or other terminations in one continuous operation. Where more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into the concrete on each side of the joint near the corners of the envelope.
 - 3. Reinforcing: Provide reinforcing steel in duct banks where they cross disturbed earth and as indicated.
 - 4. Forms: The walls of the trench may be used to form the side walls of the duct bank provided the soil is self-supporting and concrete envelope can be poured without soil inclusions. Use forms where the soil is not self-supporting.
 - 5. Minimum Clearances Between Ducts: Three inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.

6. Under roads, and paved areas, install conduits in concrete encasement of rectangular cross-section providing a minimum of 3-inch concrete cover around ducts. The concrete encasement shall extend at least 5 feet beyond the edges of paved areas and roads.

- G. Depth: Top of duct to finished grade.
 - 1. Non-vehicular traffic areas: Minimum 36 inches.
 - 2. Vehicular traffic areas: Minimum 36 inches.
 - 3. Utility service duct(s): Minimum 36 inches.
- H. Prevent foreign matter from entering ducts by using temporary closure protection.
- I. Complete installation of ducts before starting installation of conductors within ducts.
- J. Make bends and offset so the inside diameter is not effectively reduced.
- K. Use duct fittings that are of types compatible with the associated duct and suitable for the use and location.
- L. Provide bushings of the following types:
 - 1. Plastic Bushings: At location required to have a bushing installed per NEC, and on all ducts 2 inches and larger.
 - 2. Metal Insulated Grounding Bushings: At location that metallic ducts are not electrically bonded by terminating fittings to the enclosure the ducts terminate at.
- M. Termination: Where ducts are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. Where terminations cannot be made secure with 1 locknut, use 2 locknuts, 1 inside and 1 outside the box.
- N. Where terminating in threaded hubs, screw the duct or fitting tight into the hub so the end bears against the wire protection shoulder.
- O. Install pull tape in empty ducts. Provide nylon line having not less than 200 pound tensile strength. Leave not less than 12 inches of slack at each end of the pull tape. Identify each pull tape.
- P. Stub-up Extensions: Nonmetallic ducts shall have GRC stub-up extensions starting at minimum 24 inches below finished grade for exterior locations except pole bases or fixture bases. Ducts shall have GRC stub-up extension starting at a minimum 2 inches below bottom of concrete slabs except at pad type transformers, floor mounted switchboards, and floor mounted switchgears unless indicated otherwise.
- Q. Raceway Caps: Install caps on all spare ducts. Caps shall match and mate with the duct installed on.
- R. Sealing: For ducts to be wired in this project, provide temporary closure at terminations prior to installation of wire. Provide seals after installation of wire. For spare ducts, seal bore of ducts at terminations. Use sealing compound and plugs as required to withstand 15 psi minimum hydrostatic pressure.
- S. Duct layout is only schematic. Exact location of ducts shall be coordinated during construction with building structure, underground structures and other work.
- T. Install voltage warning tape above all underground ducts at 12" below finished grade.
- U. Install transformer box pads in compliance with manufacturer's recommendations. Top of box pad is to be 3" above finished grade. Install a 6" high x 12" gravel ring at base of box pad.

- V. Anchor transformer to box pad in compliance with manufacturer's recommendations.
- W. Install Box Pad Covers, transformer deferral brackets, portable feedthroughs, and all necessary mounting hardware per the manufacturer's recommendations on transformer box pads that will not have a transformer installed. Make all cable termination as specified else where herein with sufficient cable to put on a future transformer. Install a fault indicator on conductors, one on each transformer deferral bracket.
- X. Where noted on the drawing, install a looping pedestal in complete compliance with the manufacturers recommendation, and as may be detailed on the drawing. Install sufficient cable for the future installation of a transformer box pad and a transformer.

3.04 MANUFACTURER'S TEST DATA

- A. Test data results from DSET Laboratories using the EMMAQUA Test Method with the results of the equivalent of two standard ultraviolet light years showing no change in Fiber Show or Fiber Bloom and no worse than "Good" rating on General Appearance and Color Change. An alternate test for UV resistance can be the ASTM-G-70 Test Method with a maximum of change of 2.3 MacAdam Units after one thousand hours of exposure in a Model 65WR Atlas Weatherometer.

3.05 FIELD TESTING

- A. Duct Integrity: Rod ducts with a mandrel 1/4-inch smaller in diameter than internal diameter of ducts. Where rodding indicates obstructions in ducts, remove the obstructions and retest.

3.06 CLEANING AND RESTORATION

- A. Clean Ducts: Clean full length of ducts with a round bristle brush with a diameter 1/2 inch greater than internal diameter of duct.
- B. Restore surface features at areas disturbed by excavation and re-establish original grades except as indicated otherwise. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work to their original condition. The restoration shall include, as necessary, topsoiling, fertilizing, liming, seeding, sodding, sprigging, or mulching. All such work shall be performed in accordance with Division 2 sections. Maintain disturbed surfaces. Restore vegetation in accordance with Division 2 sections. Restore disturbed paving in accordance with section "PAVING AND SURFACING."

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16120

WIRES AND CABLES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes wires, cables, and connectors for power, lighting, signal, control and related systems rated 600 volts and less.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 16 Section "Control/Signal Transmission Media" for telephone and communication wiring, including optical fiber cable.
 - 2. Division 16 Section "Medium-Voltage Cables."
 - 3. Division 16 Section "Supporting Devices" for supports and anchors for fastening cable directly to building finishes.
 - 4. Division 16 Section "Electrical Identification" for insulation color coding and wire and cable markers.

1.03 SUBMITTALS

- A. Product Data for electrical wires, cables and connectors.
- B. Test data forms.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with provisions of the following code:
 - 1. NFPA 70 "National Electrical Code."
 - a. Conform to applicable codes and regulations regarding toxicity of combustion products of insulating materials.

2. UL Compliance: Provide components which are listed and labeled by UL under the following standards.
 - a. UL Std. 83 – Thermoplastic-Insulated Wires and Cables.
 - b. UL Std. 486A – Wire Connectors and Soldering Lugs for Use with Copper Conductors.
3. NEMA/ICEA Compliance: Provide components which comply with the following standards:
 - a. WC-5 – Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 - b. WC-7 – Cross Linked Thermosetting Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
4. IEEE Compliance: Provide components which comply with the following standard.
 - a. Std. 82 – Test procedures for Impulse Voltage Tests on Insulated Conductors.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 1. Wire and Cable:
 - a. American Insulated Wire Corporation.
 - b. Carol Cable Co. Incorporated.
 - c. Southwire Company.
 2. Connectors for Wires and Cable Conductors:
 - a. Burndy Corporation.
 - b. Minnesota Mining and Manufacturing Company.
 - c. Thomas and Betts Corporation.

2.02 WIRES AND CABLES

- A. General: Provide wire and cable suitable for the temperature, conditions and location where installed and UL listed for particular application.
- B. Conductors: Provide copper solid conductors for power and lighting circuits No. 10 AWG and smaller. Provide stranded conductors for sizes No. 8 AWG and larger. Provide copper stranded conductors for control system.

- C. Insulation: Provide and use the following insulation types:
1. Type THHN, dry and damp locations, 75 degrees C (167 degrees F).
 2. Type THWN, dry and wet locations, 75 degrees C (167 degrees F); wet locations, #8 AWG and smaller.
 3. Type THWN-2, dry and wet locations, 75 degrees C (167 degrees F); wet locations, #8 AWG and smaller.
 4. Type XHHW, dry and damp locations, 75 degrees C (167 degrees F); wet locations 75 degrees C (167 degrees F); wet locations, #6 AWG and larger.
 5. Type NM, use only in residential, wood stud construction, concealed (except as noted elsewhere), indoors.
 6. Type USE (Type RHW insulated with Neoprene Jacket) for service entrance, 75 degrees C.
 7. Type XHHW-2, dry and wet locations, 75 degrees C (167 degrees F); wet locations, #6 AWG and larger.
 8. Type SO for flexible cords.
 9. Types TF, TFF, TFN, TFFN for Class I remote-control, signaling circuits.
 10. Types per NEC for Class 2 remote-control, signaling circuits.
 11. Types per NEC for Class 3 remote-control, signaling circuits.
 12. Types per NEC for nonpower-limited and power-limited fire protective signaling circuits.
- D. Color Coding for phase identification in accordance with Table 1 in Part 3.
- E. Provide wires and cables sized per National Electrical Code based upon the overcurrent protective device ampere rating indicated and the neutral conductor as a current-carrying conductor, unless indicated to be larger.
- F. Provide wires and cables as required. All wires and cables required are not necessarily indicated.

2.03 CONNECTORS FOR CONDUCTORS

- A. Provide UL listed factory-fabricated, hypress or solderless metal connectors as required if not indicated on drawings, and of sizes, ampacity ratings, materials, types and classes for applications and for services required if not indicated on drawings. Provide connectors with temperature ratings equal to or greater than those of the wires upon which used. Split-bolt types connectors are not acceptable.

PART 3 – EXECUTION

3.01 APPLICATIONS

- A. Service entrance shall be Type USE, copper conductor, in raceway from pad-mounted transformer to meter socket to panelboard.
- B. Feeders, where in conduit, shall be Type THHN/THWN, copper conductor, otherwise shall be Type NM cable with 75°C insulation.

- C. Branch circuits shall be Type NM cable, copper conductor, 75°C insulation. Pull in conduit where required by other sections of this specification.
- D. Fire alarm interconnect circuits shall be power-limited fire protective signaling circuit cable.

3.02 INSTALLATION OF WIRES AND CABLES

- A. General: Install electrical cables, wires, and connectors in compliance with NEC. Install all wires and cables in raceways unless indicated otherwise.
- B. Coordinate cable installation with other Work.
- C. Pull conductors simultaneously where more than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary.
- D. Use pulling means including, fish tape, cable, rope, and basket weave wire/cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable.
- E. Conceal all cable in finished spaces.
- F. Install exposed cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours.
- G. Keep conductor splices to minimum.
- H. Install splice and tap connectors which possess equivalent or better mechanical strength and insulation rating than conductors being spliced.
- I. Use splice and tap connectors which are compatible with conductor material.
- J. Provide adequate length of conductors within electrical enclosures and train the conductors to terminal points with no excess. Bundle multiple conductors, with conductors larger than No. 10 AWG bundled in individual circuits. Make terminations so there is no bare conductor at the terminal. Bundle conductors using nylon ty-raps.
- K. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A and UL 486B.
- L. Minimum wire size for lighting and power circuits shall be No. 14 AWG for 15 ampere circuits and 12 AWG for 20 ampere circuits. Other circuits shall be as noted on the drawings.
- M. Minimum wire size for control and auxiliary systems shall be as required by the manufacturer of that particular system.
- N. Splices and taps for No. 10 AWG and smaller wire shall be made using Minnesota Mining and Manufacturing Company insulated "Scotch Locks," Ideal Company "Wing-Nut," Thomas and Betts Corporation "Piggy" connectors, or mechanically crimped (hypress) insulated sleeves unless indicated otherwise.

- O. Splices and taps for No. 8 AWG and larger wire shall be made using pressure type mechanical connectors or mechanically crimped (hypress) connectors unless noted otherwise on drawings. Insulate connectors using Minnesota Mining and Manufacturing Company "Scotchfill" electrical insulating putty and "Scotch 88" electrical tape to cover with minimum of two layers, half lapped or using covers as manufactured by connector manufacturer. Split-bolt type connectors are not acceptable. Connectors to be as manufactured by Burndy Corporation (FCI Company), IlSCO (Division Bardes Corporation), or Thomas and Betts Corporation.
- P. Terminations for No. 10 AWG and smaller wire shall be made using mechanically crimped (hypress) insulated fork type terminals unless the point of termination is of the pressure type design and listed to accept the type of wire being terminated.
- Q. Terminations for No. 8 AWG and larger wire shall be made using pressure type mechanical connectors or mechanically crimped (hypress) lugs unless noted otherwise on drawings. Provide Everdur type hardware (hex-head machine bolts, nuts, washer(s), lock washer(s)) that mates with lug to secure the lug to the point of termination. Terminations to be as manufactured by Burndy Corporation (FCI Company), IlSCO (Division Bardes Corporation), or Thomas and Betts Corporation. Provide 2-hole type hypress lugs for wires 250MCM and larger.
- R. Where possible, install nonmetallic sheathed cables concealed behind ceiling or wall finish. Thread cables through holes bored on approximate centerline of wood members; notching of end surfaces is not permitted. Provide sleeves through concrete or masonry for threading cables. Install exposed cables parallel or at right angles to walls or structural members. Protect exposed nonmetallic sheathed cables on walls from mechanical injury by installation in conduit or tubing. Nonmetallic sheathed cable install exposed in joist spaces of basements and garages need not be in conduit. When cable is used in metal stud construction, insert plastic stud grommets in studs at each point through which cable passes, prior to installation of cable.
- S. Appropriate connectors shall be used when installing nonmetallic sheathed cables in metal boxes, including load centers.

3.03 FIELD QUALITY CONTROL

- A. After rough-in, test installed wires and cables for electrical continuity and shorts. Also, test all circuits after devices are installed.
- B. Prior to energization, test installed service entrance with 1000 VDC megger, each phase-to-each phase and each phase-to-ground. Record data on test data forms. Provide test data as requested by the Contracting Officer for review. Any wires or cables failing to meet minimum standards as determined by the Contracting Officer shall be replaced at Contractor's expense. Provide written notice of test date/time to Contracting Officer a minimum of 48 hours prior to the test date.

C. TABLE 1: Color Coding for Phase Identification:

1. Color code No. 10 AWG and smaller conductors with factory applied color. Color code No. 8 AWG and larger conductors using colored electrical tape. Color coding shall occur at all conductor termination points and in all junction boxes and pull boxes. Conductors No. 8 AWG and larger shall have black colored insulation. Colored electrical tape shall be Minnesota Mining and Manufacturing Company "Scotch Brand 35."

<u>Phase</u>	<u>240/120 Volts</u> <u>1 phase, 3 wire</u>
A	Black
B	Red
Neutral	White
Ground	Green

END OF SECTION

SECTION 16121
CONTROL/SIGNAL TRANSMISSION MEDIA

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes cables designed and used for electrical transmission in control, audio, video, RF, and signal circuits.

1.03 SUBMITTALS

- A. Product Data for wires, cables, and connectors.
- B. Product Certificates signed by the system manufacturers, certifying that the cables are suitable for the connected equipment as described in Quality Assurance below.
- C. Test data forms.

1.04 QUALITY ASSURANCE

- A. Connected Equipment Manufacturer Approval: Where cables specified in this Section are used for systems specified in other sections of these Specifications or for systems furnished under other contracts, obtain review of the cable characteristics and approval for use with the connected system equipment by the connected equipment manufacturers.
- B. Electrical Component Standard: Provide work complying with applicable requirements of NFPA 70 "National Electrical Code."
- C. Toxicity: Comply with applicable codes and regulations regarding toxicity of combustion products of materials.
- D. UL Compliance: Comply with applicable requirements of UL Standard 910 "Test Method for Fire and Smoke Characteristics of Cables Used in Air Handling Spaces." Provide products that are UL listed and labeled for such use.
- E. NEMA/ICEA Compliance: Comply with NEMA/ICEA Standard WC 41, "Coaxial Communication Cable."

- F. Electronic Industries Association Compliance: Comply with EIA Standards EIA-230, "Color Marking of Thermoplastic Wire" and EIA-258, "Semi-Flexible Air Dielectric Coaxial Cables and Connectors, 50 Ohms."
- G. MIL-SPEC Compliance: Comply with MIL-C-3093, "Telephone Cable; Inside Distribution Wiring," MIL-C-55021, "Twisted-Pair and Triplet Cables; Hookups General Specifications," MIL-C-17/28, "Radio Frequency Flexible Coaxial Cables, 50 Ohms," and MIL-C-17/29, "Radio Frequency Flexible Coaxial Cables, 75 Ohms."

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver cable factory-packaged in containers or reels. Store in clean dry space and protect products from damaging fumes and traffic. Handle wire and cable carefully to avoid damage.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Cable/Wire:
 - a. Alpha Communications.
 - b. Belden Division; Cooper Industries.
 - c. West Penn Wire Corporation.
 - 2. Connectors:
 - a. Amp Special Industries.
 - b. Thomas & Betts Corporation.
 - c. 3M Company.
 - 3. Jacks and Plugs:
 - a. Amphenol.
 - b. Neutrik.
 - c. Switchcraft.

2.02 CONTROL/SIGNAL TRANSMISSION MEDIA

- A. General: Provide control/signal transmission media of manufacturer's standard materials as indicated by published product information, designed and constructed as recommended by manufacturer, for a complete installation.
- B. Cables: Provide factory-fabricated cables of sizes, characteristics, ratings, materials, and jacketing/sheathing as required for applications.

2.03 ELECTRONIC CABLE

- A. Single conductor coaxial for cable TV shall be 75-ohm characteristic impedance, solid polyethylene core, 100 percent coverage, copper-braid shield, foam polyethylene dielectric, polyethylene jacket; conforming to MIL-C-17, Type RG-6A/U, 18 AWG center conductor, and a maximum loss of 4.8 dB/100 feet at 500 Mhz. Coaxial cable shall also meet the approval of local cable company.
- B. Doorbell wiring shall be three conductor, No. 22 AWG copper with color coded polyvinylchloride insulation.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Contracting Officer present for compliance with requirements for installation and other conditions affecting signal/control transmission media performance. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF CONTROL/SIGNAL TRANSMISSION MEDIA

- A. General: Install control/signal transmission media in accordance with manufacturer's written instructions and in compliance with NEC.
- B. Coordinate installation of transmission media with other Work.
- C. Install transmission media without damaging conductors, shield, or jacket. Do not, either in handling or installation, bend cable to smaller radii than minimum recommended by manufacturer. Ensure that medium manufacturer's recommended pulling tensions are not exceeded. Pull conductors simultaneously where more than one is being installed in same raceway. Use pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Use pulling means, including fish tape, cable, rope, and basket weave wire/cable grips that will not damage media or raceway.
- D. Conceal all cable in finished spaces.
- E. Install exposed cable, parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.
- F. No splices are allowed except at indicated splice points.
- G. Use splice and tap connectors that are compatible with media material. All splices and tap connections shall be made within junction boxes.
- H. Tighten connectors and terminals, including screws and bolts, in accordance with manufacturer's published instructions or torque tightening values.
- I. All telephone cable to be terminated at all wall jacks indicated. Telephone cable is to be terminated such that it is suitable for "multi-line" operation.

- J. All cable TV cable is to be terminated at all wall jacks indicated.

3.03 FIELD QUALITY CONTROL

- A. Copper Cable Testing Procedures: Inspect for physical damage and test cable for continuity and shorts. Use time-domain reflectometer with strip-chart recording capability and anomaly resolution to within 12 inches (300 mm) in runs up to 1000 feet (300 m) in length. Test cable segments faulty connectors, splices, terminations, and the integrity of the cable and its component parts.
- B. Replace malfunctioning cables at Project site, where possible, and retest to demonstrate compliance.

END OF SECTION

SECTION 16124

MEDIUM-VOLTAGE CABLES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes cables and related splices, terminations, and accessories for 12,470-volt electrical distribution systems.
- B. Related Sections: The following Division 16 Sections contain requirements that relate to this Section:
 - 1. “Supporting Devices” for cable and termination supports.
 - 2. “Electrical Identification” for cable markers.
 - 3. “Single Phase Pad-Mounted Transformers” for cable termination provisions.

1.03 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
 - 1. Product data for cables and cable accessories, including splices and terminations.
 - 2. Product certificate signed by manufacturer that its products comply with the specified requirements.
 - 3. Qualification data for firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of contacts and references, and other information specified.
 - 4. Product Test Reports: Certified reports of manufacturers’ design and production tests indicating compliance of cable and accessories with referenced standards.
 - 5. Field test reports indicating and interpreting test results relative to compliance with performance requirements specified. Include certified copies of field test records.
 - 6. Maintenance data for cables and accessories to include in the “Operating and Maintenance Manual” specified in Division 1.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced and certified cable splicer to install, splice, and terminate medium-voltage cable.
- B. Firm experienced in manufacturing medium-voltage cable and accessories similar to those indicated for this Project, with a record of successful in-service performance.
- C. In addition to the requirements specified in Division 1 Section "Quality Control Services," an independent testing firm shall meet OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, or shall be a full member company of the International Electrical Testing Association (NETA).
 - 1. Testing Firm's Field Supervisor Qualifications: A person currently certified by the NETA or National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- D. Comply with NFPA 70 "National Electrical Code" for components and installation.
- E. All medium-voltage cable shall be the product of a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver medium-voltage cable on factory reels conforming to NEMA WC26.
- B. Store cables on reels on elevated platforms in a dry location.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Cables:
 - a. American Insulated Wire Corp., Leviton Manufacturing Co.
 - b. Carol Cable Co., Inc.
 - c. Power Cable Division, Pirelli Cable Corp.
 - d. Rome Cable Corp.
 - e. Southwire Co.
 - 2. Cable Splicing and Terminating Products and Accessories:
 - a. Cooper Power Systems, Inc., RTE Components.
 - b. Elastimold.
 - c. G & W Electric Co.

- d. Energy Division, Raychem Corp.
- e. Adalet-PLM, Scott Fetzer Co.
- f. Thomas and Betts.
- g. 3M Corp.

3. Fault Indicator:

- a. Fisher Pierce.
- b. RTE.
- c. Cooper.

2.02 CABLES

- A. Medium-voltage cables shall be Type UD, aluminum conductor, Class B conductor stranding, with ethylene propylene rubber (EPR) insulation conforming to NEMA WC 8 (ICEA S-68-516), 15 kV voltage rating.
- B. The phase conductor is solid, 1350-H19 aluminum alloy. The cable is composed of the conductor, covered by a semi-conducting crosslinked polyethylene strand shield, an ethylene propylene rubber primary insulation, and a semi-conducting crosslinked polyethylene insulation shield. Conductors shall have a 133% insulation level. A concentric neutral of bare copper wires and an insulating polyethylene jacket shall be applied over the insulation shield. The cable is identified by surface print on the jacket and with the lightning bolt symbol for supply cables indented in the jacket.

2.03 SOLID TERMINATIONS

- A. Conductor terminations shall comply with IEEE Standard 48, as indicated. Insulation class equivalent to that of the cable. Terminations for shielded cables include a shield grounding strap.
 - 1. Class 1 termination for shielded cable in locations not exposed to the weather shall be modular type, furnished as a kit, with stress-relief tube, multiple molded silicone rubber insulator modules, shield ground strap, and compression-type connector.
 - 2. Class 1 termination for shielded cable in locations exposed to the weather shall be modular type, furnished as a kit, with stress-relieving shield terminator; multiple-wet-process, porcelain, insulator modules; shield ground strap, and compression-type connector; and weather shield.
- B. Termination for Nonshielded Cable: Kit with compression-type connector. Include silicone rubber tape, cold-shrink rubber sleeve, or heat-shrink plastic sleeve moisture seal for end of insulation whether or not supplied with kits.

2.04 SEPARABLE INSULATED CONNECTORS

- A. Separable Insulated Connectors: Modular system complying with IEEE 386. Disconnecting, single-pole, cable terminators and matching stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture.

1. Terminations at distribution points shall be modular type, consisting of terminators installed on cables and modular, dead-front, terminal junctions for interconnecting cables.

2. Load-Break Cable Terminators: Elbow-type units with 200-ampere load make/break and continuous current rating. Coordinate with insulation diameter and conductor size and material of cable being terminated. Include capacitively coupled test point on terminator body.
3. Dead-front terminal junctions shall be modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals. Grounding lug and manufacturer's standard accessory stands and stainless-steel mounting brackets and attaching hardware.
4. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
5. Portable Feed-Through Accessory: Two-terminal dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
6. Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding 3 phases of feeders, and carrying case.
7. Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable elbow terminator.
8. Surge Arresters: ANSI/IEEE C62.11, rated 9 kV, fully shielded, dead-front metal-oxide-varister, elbow or parking stand type with resistance-graded gap suitable for plugging into bushing well inserts. Provide one arrester for radial feed circuits.
9. Loadbreak Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated with two parking stands, watertight conductor connection between terminals. Grounding lug and manufacturer's standard accessory stands and stainless-steel mounting brackets, plate, and attaching hardware.

2.05 ARC-PROOFING MATERIALS

- A. Tape for First Course on Metal Objects: 10-mil (250-micron) -thick, corrosion-protective, moisture-resistant PVC pipe-wrapping tape.
- B. Arc-Proofing Tape: NRTL-listed fireproofing tape, flexible, conformable, intumescent to 0.3 inch (8 mm) thick, and compatible with the cable jacket on which used.
- C. Glass Cloth Tape: Pressure-sensitive adhesive type, 1/2 inch (13 mm) wide.

2.06 FAULT INDICATORS

- A. Fault indicators shall be mounted on underground cables.
- B. Fault indicators shall indicate faults on the primary electric system and shall have a lexan housing with nickel iron sensor laminations in a polyurethane potting compound. The unit shall employ a Hotstick mounting technique, and shall be suitable for clamping around the type and size of conductor used.
- C. The fault indicators shall be completely self-contained requiring no external wiring or power supply, sealed and rated for the installation in wet locations and shall automatically reset upon restoration of power. Resetting shall not require any external tools. The device shall come with inrush restraint in order to prevent tripping when transformer cores and cables are magnetized during initial power-up conditions. The device shall come with an audible tone

module and shall activate to indicate that the device has tripped. Upon automatic reset, the tone shall cease.

- D. The setting of the fault indicator shall be as follows, unless noted otherwise on the drawings. Verify final setting with Base:

Trip Setting: 650 Amperes for 4/0 AWG and 450 Amperes for 1/0 AWG.

Auto Reset Level: 4 hour time delay with current reset override at 3 Ampere minimum reset.

2.07 SOURCE QUALITY CONTROL

- A. Test and inspect cables according to NEMA WC 8 before shipping.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine raceways to receive medium-voltage cables for compliance with installation tolerances and other conditions affecting performance of the cable. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install medium-voltage cable as indicated, according to manufacturer's written instructions and IEEE 576.
- B. Pull conductors simultaneously where more than one cable is indicated in same raceway. Use NRTL-listed and manufacturer-approved pulling compound or lubricant where necessary. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceways. Do not use rope hitches for pulling attachment to cable.
- D. Install exposed cable parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- E. Install direct buried cable on a leveled and tamped 3-inch (75mm) bed of clean sand at the bottom of trench. Install "buried cable" warning tape 12 inches (305 mm) above cable. Separate cables crossing other cables or piping from those items by a minimum of 4 inches (100 mm) of tamped earth. Install permanent markers at ends of cable runs, changes in direction, and buried splices.
- F. In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit and support cables at intervals adequate to prevent sag.
- G. Install splices at pull points and elsewhere as indicated using standard kit. Conform to kit manufacturer's written instructions.

- H. Install terminations at ends of conductors and seal multiconductor cable ends with standard kits. Conform to manufacturer's written instructions. Comply with classes of terminations indicated.
- I. Install separable insulated connector components where indicated in accordance with manufacturer's written instructions.
- J. Provide the following quantities of components:
 - 1. Install protective caps at each terminal junction, 1 on each terminal to which no feeder is indicated to be connected.
 - 2. Provide 3 additional portable feed-through accessories over that which is required by the drawings.
 - 3. Provide 3 additional standoff insulators over that which is required by the drawings.
- K. Arc-Proofing: Arc-proof medium-voltage cable at locations not protected by conduit, cable tray, direct burial, or termination materials except where indicated. Apply as follows and as recommended by the manufacturer of the arc-proofing tape.
 - 1. Clean cable sheath.
 - 2. Wrap metallic cable components with 10-mil (250-micron) pipe wrapping tape.
 - 3. Smooth surface contours with electrical insulation putty.
 - 4. Apply arc-proofing tape in one half-lapped layer with the coated side toward the cable.
 - 5. Band the arc-proofing tape with 1-inch (25mm) -wide bands of half-lapped adhesive glass-cloth tape 2 inches (50 mm) on center.
- L. Fault Indicators: Install one fault indicator on each phase at each point, (one, per phase, per Transformer, Sectionalizing Cabinet, etc.) of the system. Installation to be complete with all necessary wiring, batteries, mounting hardware, etc., and in complete compliance with manufacturers recommendations.
- M. Where cables are installed in a looping pedestal, a loop of sufficient length shall be installed to allow the future addition of a transformer box pad and a transformer, including all terminators.

3.03 GROUNDING

- A. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated connector fittings, and hardware according to manufacturer's written instructions.

3.04 IDENTIFICATION

- A. Identify cable in accordance with Division 16 Section "Electrical Identification."

3.05 FIELD QUALITY CONTROL

- A. Testing Firm: Provide the services of a qualified independent testing firm to perform specified field quality-control testing.

- B. Testing: Upon installation of medium-voltage cable and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
 - 1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA Standard ATS, Section 7.3.2. Certify compliance with test parameters.
- C. Correct malfunctioning units at site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

3.06 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to Manufacturer and Installer, to prevent entrance of moisture into the cable and ensure that medium-voltage cable is without damage or deterioration at Substantial Completion.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16135

CABINETS, BOXES, AND FITTINGS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this section.

1.02 SUMMARY

- A. This section includes cabinets, boxes, and fittings for electrical installations and certain types of electrical fittings not covered in other sections. Types of products specified in this Section include:
 - 1. Outlet and device boxes.
 - 2. Pull and junction boxes.
 - 3. Floor boxes and service fittings.
 - 4. Cabinets.
 - 5. Enclosures.
 - 6. Hinged door enclosures.
 - 7. Meter socket enclosure.

1.03 DEFINITIONS

- A. Cabinets: An enclosure designed either for surface or for flush mounting and having a frame, or trim in which a door or doors may be mounted.
- B. Device Box: An outlet box designed to house a receptacle device or a wiring box designed to house a switch.
- C. Enclosure: A box, case, cabinet, or housing for electrical wiring or components and with a removable panel.
- D. Hinged Door Enclosure: An enclosure having swinging doors or covers secured directly to and telescoping with the walls of the box.
- E. Outlet Box: A wiring enclosure where current is taken from a wiring system to supply utilization equipment.
- F. Wiring Box: An enclosure designed to provide access to wiring systems or for the mounting of indicating devices or of switches for controlling electrical circuits.

1.04 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
 - 1. Product data for pull boxes, junction boxes, floor boxes, service fittings, cabinets, and enclosures.
 - 2. Shop drawings for items that are to be shop fabricated. For shop fabricated items boxes, show accurately scaled views and spatial relationships to adjacent equipment. Show box types, dimensions, finishes, and hardware.

1.05 QUALITY ASSURANCE

- A. UL Listing and Labeling: Items provided under this section shall be listed and labeled by UL.
- B. National Electrical Code Compliance: Components and installation shall comply with NFPA 70 "National Electrical Code."
- C. NEMA Compliance: Comply with NEMA Standard 250, "Enclosures for Electrical Equipment (1000 Volts Maximum)."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Outlet and Device Boxes:
 - a. American Electric (Steel City).
 - b. Appleton Electric Company.
 - c. Raco, Incorporated.
 - 2. Pull and Junction Boxes:
 - a. American Electric (Steel City).
 - b. Hoffman Engineering Company.
 - c. Vynicker, Incorporated.
 - 3. Floor Boxes:
 - a. American Electric (Steel City).
 - b. Butler Mfg. Company (Walker).
 - c. Square D Company.

- 4. Hinged Door Enclosure:
 - a. English Electric Corporation.
 - b. Hoffman Engineering Company.
 - c. Square D Company.
- 5. Meter Socket Enclosure
 - a. ITE Siemens.
 - b. Square D Company.
 - c. Cutler Hammer.

2.02 CABINETS, BOXES, AND FITTINGS, GENERAL

- A. Electrical Cabinets, Boxes, and Fittings: Of indicated types, sizes, and NEMA enclosure classes. Where not indicated, provide units of types, sizes, and classes appropriate for the use and location. Provide all items complete with covers and accessories required for the intended use.

2.03 MATERIALS AND FINISHES

- A. Sheet Steel: Flat-rolled, code-gage, galvanized steel.
- B. Fasteners for General Use: Corrosion resistant screws and hardware including cadmium and zinc plated items unless indicated otherwise.
- C. Fasteners for Damp, Wet or Exterior Locations: Stainless steel screws and hardware unless indicated otherwise.
- D. Cast Metal for Boxes, Enclosures, and Covers: Copper-free aluminum unless indicated otherwise.
- E. Exterior Finish: Gray baked enamel for items exposed in finished locations unless indicated otherwise.
- F. Interior Finish: Gray baked enamel, except white baked enamel for enclosures.
- G. Materials for Exterior Locations: Cast metal and stainless steel.
- H. Fittings for Boxes, Cabinets, and Enclosures: Conform to UL 14B. Malleable iron or zinc plated steel for conduit hubs, bushings and box connectors.

2.04 OUTLET, DEVICE, AND SMALL WIRING BOXES

- A. General: Conform to UL 514A, "Metallic Outlet Boxes, Electrical," and UL 514B, "Fittings for Conduit and Outlet Boxes." Boxes shall be of type, shape, size, depth and NEMA class to suit each location and application.
- B. Steel Boxes: Conform to NEMA OS 1, "Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports." Boxes shall be sheet steel with stamped knockouts, threaded screw holes and

accessories suitable for each location including mounting brackets and straps, cable clamps, exterior rings and fixture studs.

- C. Cast-Iron Boxes: Iron alloy, waterproof, with threaded raceway entries and features and accessories suitable for each location, including mounting ears, threaded screw holes for devices and closure plugs.
- D. Nonmetallic boxes shall conform to NEMA OS 2.
- E. Cast-Iron Floor Boxes: Fully adjustable, waterproof, with threaded raceway entrances, adjusting rings, gaskets, and floor plates. Provide multi-section boxes as required. Provide floor plates and covers as indicated. Provide flush with finished floor unless indicated otherwise.
- F. Steel Floor Boxes: Sheet steel, concrete tight, fully adjustable, with stamped knockouts, adjusting rings, and floor plates. Provide multi-section boxes. Provide floor plates and covers as indicated. Provide flush with finished floor unless indicated otherwise.
- G. Service Fittings for Floor Outlet Boxes: Surface mounted, suitable for finished spaces, and finished as noted on drawings. Equip fitting for attaching flat to floor box cover.

2.05 PULL AND JUNCTION BOXES

- A. General: Comply with UL 50, "Electrical Cabinets and Boxes," for boxes over 100 cubic inches volume. Boxes shall have screwed or bolted on covers of material same as box and shall be of size, shape and NEMA class to suit application unless indicated otherwise.
- B. Steel Boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal structural steel bracing.
- C. Hot-Dipped Galvanized Steel Boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal structural steel bracing. Hot-dip galvanized after fabrication.
- D. Cast-Iron Boxes: Molded of cast iron alloy with gasketed cover and integral threaded conduit entrances.
- E. Cast Nonmetallic Boxes: Ultra-violet stabilized, nonconductive, high impact-resistant PVC boxes with gasketed cover and integral mounting flanges.

2.06 METER SOCKET ENCLOSURE

- A. Meter socket enclosure to be single unit, 200 Ampere, Ring Type, NEMA 3R, Solid Top, Isolated Neutral.
- B. Provide solid bypass plugs.
- C. Provide meter opening coverplate.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locations: Install items where indicated and where required to meet code requirements and suit installation conditions.
- B. Cap unused knockout holes where blanks have been removed and plug unused conduit hubs. Caps shall be gasketed stainless steel type secured by means of stainless steel washer and wingnut.
- C. Support and fasten items securely in accordance with Division 16 Section "SUPPORTING DEVICES."
- D. Sizes shall meet NEC requirements, unless indicated to be larger.
- E. Remove sharp edges where they may come in contact with wiring or personnel.
- F. Installations shall be parallel and perpendicular to floor, wall, and ceiling lines.
- G. Appropriate connectors shall be used for the installation of nonmetallic sheathed cable in the knockouts of the panel board or load center.

3.02 APPLICATIONS

- A. Outlet Boxes and Fittings: Install outlet and device boxes and associated covers and fittings of materials and NEMA types suitable for each location and in conformance with the following requirements.
 - 1. Interior Concealed Dry Locations: Nonmetallic, NEMA type 1, unless indicated otherwise.
 - 2. Interior Exposed Dry Locations: Sheet steel, NEMA type 1, unless indicated otherwise.
 - 3. Locations Exposed to Weather or Dampness: Cast metal, NEMA type 3 unless indicated otherwise.
 - 4. Boxes installed in Demising Walls (fire walls between units) shall be NEMA TYPE 1 steel.
- B. Pull and Junction Boxes: Provide pull and junction boxes of materials and NEMA types required to meet NEC and as suitable for each location unless indicated otherwise.
- C. Exterior Locations: Provide items of cast nonmetallic materials.

3.03 INSTALLATION OF OUTLET, DEVICE, PULL, JUNCTION AND FLOOR BOXES, AND SERVICE FITTINGS

- A. Locations in Special Finish Materials: For boxes mounted in desks or furniture cabinets or in glazed tile, concrete block, marble, brick, stone or wood walls, and all other materials except gypsum board use rectangular shaped boxes plumb and/or level with square corners and straight sides. Install such boxes plumb and/or level without plaster rings. Saw cut all recesses.

- B. Gasketed Boxes: At the following locations use cast metal, threaded hub type boxes with gasketed weatherproof covers:
 - 1. Exterior locations.
 - 2. Damp or wet locations.
 - 3. Where exposed to moisture laden atmosphere.
 - 4. As indicated.
- C. Mounting: Mount boxes for switches with the long axis vertical unless indicated otherwise. Mount boxes for receptacles vertically unless indicated otherwise. Three or more gang boxes shall be mounted with the long axis horizontal. Locate box so covers or device plates will not span different types of building finishes either vertically or horizontally. Locate boxes in masonry walls so that covers or device plates do not extend onto adjacent blocks or bricks. Locate boxes for switches near doors on the side opposite the hinges. Install boxes so that consistent elevations of device plates and trim panels top edge shall be maintained at location devices are shown or specified or intended to be mounted at the same height.
- D. Outlet heights given below are general. Adjustments will possibly be necessary for job conditions. In unfinished block walls, adjust height to coursing of blocks. Unless otherwise noted or required by job conditions, the outlet heights to centerline for permanent building walls to be:
 - 1. Switches and Dimmers - 48" above floor (not to be exceeded).
 - 2. Duplex Receptacles – 18" above floor.
 - 3. Telephone Outlets – 18" above floor.
 - 4. Power Receptacles – 18" above floor.
 - 5. Other Outlets – 18" above floor.
 - 6. Clock Outlets – 12" below ceiling.
- E. Location of outlet boxes shown on drawings are approximate and not to be scaled. Determine exact locations according to building conditions, equipment requirements, and good practice. In all cases, NEC required spacing for receptacles shall be maintained.
- F. The location of lighting switch boxes to be on the latch side of the door.
- G. Cover Plates for Surface Boxes: Use plates sized to box front without overlap.
- H. Protect boxes to prevent entrance of plaster and debris. Thoroughly clean foreign material from boxes before conductors are installed.
- I. Coordinate installation of identifying devices after completion of covering and painting, where devices are applied to surfaces. Install identifying devices prior to installation of acoustical ceilings and similar concealment.

3.04 METER SOCKET INSTALLATION

- A. Install meter socket at location shown on drawing. Coordinate location with other equipment shown in that same area.
- B. Install bypass plugs and meter opening cover.

3.05 GROUNDING

- A. Electrically ground metallic cabinets, boxes, and enclosures. Where wiring to item includes a grounding conductor, provide a grounding terminal in the interior of the cabinet, box or enclosure.

3.06 CLEANING AND FINISH REPAIR

- A. Upon completion of installation, inspect components. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, abrasions and weld marks.
- B. Galvanized Finish: Repair damage using a zinc-rich paint recommended by the manufacturer.
- C. Painted Finish: Repair damage using matching corrosion inhibiting touch-up coating.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16143

WIRING DEVICES AND OTHER INTERIOR DEVICES AND SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Receptacles (Convenience outlets).
 - 2. Ground Fault Circuit Interrupter Receptacles.
 - 3. Plugs.
 - 4. Plug Connectors.
 - 5. Snap Switches.
 - 6. Incandescent Lamp Dimmer-Switches.
 - 7. Wall Plates.
 - 8. Doorbell Devices.
 - 9. Telephone Outlets.
 - 10. Cable TV Outlets.
 - 11. Multi-station Smoke Detectors & Carbon Monoxide Detectors.
 - 12. Watthour meter.

1.03 SUBMITTALS

- A. Product data for each type of product specified.
- B. Samples of products including color and finish.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with provisions of the following codes.
- B. NFPA 70 "National Electrical Code."
- C. UL and NEMA Compliance: Provide wiring devices which are listed and labeled by UL and comply with applicable UL and NEMA standards.

1.05 SEQUENCE AND SCHEDULING

- A. Schedule installation of finish plates after the surface upon which they are installed has received final finish.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Receptacles:
 - a. Hubbell Incorporated.
 - b. Leviton Manufacturing Company, Incorporated.
 - c. Pass and Seymour, Incorporated.
 - 2. Ground Fault Circuit Interrupter Receptacles:
 - a. Hubbell, Incorporated.
 - b. Leviton Manufacturing Company, Incorporated.
 - c. Pass and Seymour Incorporated.
 - 3. Snap Switches:
 - a. Hubbell Incorporated.
 - b. Leviton Manufacturing Company, Incorporated.
 - c. Pass and Seymour Incorporated.
 - 4. Incandescent Lamp Dimmer-Switches:
 - a. Hubbell Incorporated.
 - b. Leviton Manufacturing Company, Incorporated.
 - c. Pass and Seymour Incorporated.
 - d. Lutron Electronics Company, Incorporated.
 - 5. Wall Plates:
 - a. Hubbell Incorporated.
 - b. Leviton Manufacturing Company, Incorporated.
 - c. Pass and Seymour, Incorporated (Legrand, Sierra).
 - d. Lutron Electronics Company, Incorporated.
 - 6. Floor Service Outlets:
 - a. American Electric (Steel City; Midland-Ross Corporation).
 - b. Hubbell, Incorporated.
 - c. Wiremold Corporation.

7. Plugs and Plug Connectors:
 - a. Hubbel Incorporated.
 - b. Leviton Manufacturing Incorporated.
 - c. Pass and Seymour, Incorporated.

2.02 WIRING DEVICES

- A. General: Provide wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated which are UL listed and which comply with NEMA WD 1 and other applicable UL and NEMA standards.
- B. Receptacles:
 1. Duplex: Provide duplex residential-grade type receptacles, 2 pole, 3 wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke, 15 or 20 amperes as required, 125 volts, with metal plaster ears; design for side and back wiring with spring loaded, screw activated pressure plate, with NEMA configuration 5-15R or 5-20R, Leviton 5320 or CR20 series or equal.
 2. Simplex: Provide single specification-grade type receptacles, 2 pole, 3 wire grounding, with green hexagonal equipment ground screw, 20 amperes, 125 volts, with metal plaster ears, design for side and back wiring with spring loaded, screw activated pressure plate, with NEMA configuration 5-20R, Leviton Series 5801 or equal.
 3. GFCI Receptacles: Provide duplex specification grade type GFCI receptacles, 2 pole, 3 wire grounding, 15 or 20 amperes as required, 125 volts, feed through type Leviton 6599 series or equal.
 4. Dryer receptacles to be NEMA 14-30 or 10-30 configuration, rated 30 amperes, 125/250 volts.
 5. Switched Duplex Receptacles: Provide separate terminals for each ungrounded pole. Top receptacle shall be switched when installed.
 6. 15 ampere receptacles may be installed on all 15 ampere circuits and on 20 ampere circuits where 2 or more receptacles are installed, unless otherwise noted. On 20 ampere circuits where only a single receptacle is installed, the receptacle shall be a 20 ampere receptacle.
- C. Plugs and Connectors:
 1. Plugs: Provide as required unless indicated otherwise; match NEMA configuration with power sources.
 2. Connectors: Provide as required unless indicated otherwise; match NEMA configuration to mating plug's.
 3. Provide specification grade plugs and connectors.
- D. Switches:
 1. Snap: Provide residential grade type single-pole AC switches, 15 amperes, 120 volts AC, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle or key handle, side-wired or push-in wiring. Leviton 1451 series or equal.
 2. Three Way: Provide residential grade type 3-way AC switches, 15 amperes, 120 volts, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle or key handle, side-wired or push-in wiring. Leviton 1453 series or equal.

3. Four Way: Provide commercial specification grade, or residential grade, if available, type 4-way AC switches, 15 amperes, 120 to 277 volts, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle or key handle, side-wired or screw terminals. Leviton 1104 series or equal.
 4. Double Pole: Provide commercial specification grade, or residential grade, if available, type double pole AC switches, 15 amperes, 120 to 277 volts AC, with mounting yoke insulated from mechanism, equip with plaster ears, switch handle or key handle, and side-wired screw terminals. Leviton 1102 series or equal.
- E. Incandescent Lamp Dimmers: Modular dimmer switches for incandescent fixtures; switch poles and wattage as indicated, 120 volts, 60 Hz. Equip with electromagnetic filters to eliminate noise and RF and TV interference and with voltage compensation circuitry. Dimmer to have square law dimming control. Provide manufacturer and type as indicated.

2.03 WIRING DEVICE ACCESSORIES

- A. Plates: Provide UL listed, one-piece device plates for outlets to suit the devices installed. Plates on finished walls shall be high impact nylon or lexan, minimum 0.03-inch wall thickness. Plates shall be same color as receptacle or toggle switch with which they are mounted (white unless otherwise noted). Screws shall be machine-type with countersunk heads in color to match finish of plate. Sectional type device plates will not be permitted. Plates installed in wet locations shall be gasketed and UL listed for "wet locations." Plates shall be in compliance with UL 514A and UL 514C for physical strength. Attach device plates with spanner head bolts.
- B. Weatherproof Receptacles: Provide in cast metal box, where surface mounted, otherwise recessed, with gasketed, weatherproof, flame retardant, UV stabilized polycarbonate, non-conductive cover plate and gasketed cap over receptacle opening. Provide caps with a spring-hinged flap. Receptacle shall be UL listed for use in "wet locations." Taymac #10310 or equivalent.

2.04 MATERIAL, FINISH, COLOR

- A. All Others: Devices shall be white unless indicated otherwise. Plates shall be smooth white unless indicated otherwise.
- B. Exterior: Devices shall be gray. Cover as indicated for weatherproof receptacle.
- C. Surface Mounted on Pressed Steel Box: Devices shall be gray. Plates shall be fully raised steel covers.
- D. Engraving: Provide as indicated.

2.05 DOORBELL

- A. Doorbells shall be single signal, chime type, surface mounted with off-white color solid molded plastic front approximately 8 inches wide by 5.5 inches high by 2 inches deep with back box, 10 volts.
- B. Doorbell transformer, UL 506. Doorbell transformers shall be 120 volt primary and 10 volt secondary, 10 watts, Class 2 energy-saving type, suitable for mounting in doorbell back box.

- C. Doorbell pushbutton stations shall be rectangular decorator type, lighted semi-flush mounted with anodized aluminum finish.
- D. Doorbell wiring shall be as specified in Section "Control/Signal Transmission Media."

2.06 TELEPHONE SYSTEM

- A. Provide interior telephone system including service conduit, telephone outlets, wiring, and accessories.
- B. Outlet boxes for telephone system shall be standard type, as specified herein, 2 inches by 4 inches. Mount flush in finished walls at height indicated specified for outlet receptacles. Outlet boxes for wall-mounted telephones shall be 2 inches by 4 inches by 1-1/2 inches deep; mounted at height 60 inches above finished floor for wall hung (kit) and 18" everywhere else. Outlet boxes for handicapped wall hung kitchen telephone station shall be 2 inches by 4 inches by 1-1/2 inches deep and mounted at height 48 inches above finished floor.
- C. Telephone cables as specified in Section "Control/Signal Transmission Media."
- D. Telephone module jacks, FCC Part 68, modular four-wire type.
- E. Telephone cover plates modular telephone type with same finish specified for receptacle and switch cover plates.

2.07 CABLE TELEVISION SYSTEM

- A. Provide cable television distribution system including cable, outlets and raceways to allow the distribution of a commercial television signal for each living unit.
- B. Outlet boxes for television system shall be standard type, as specified herein. Mount flush in finished walls at height specified for outlet receptacles.
- C. Television interior cable shall be as specified in Section "Control/Signal Transmission Media."

2.08 MULTI-STATION SMOKE AND CARBON MONOXIDE DETECTORS

- A. NFPA 72. Provide 120 VAC multi-station photoelectric smoke and carbon monoxide detectors as indicated. Detectors shall not be subject to loss of power by the operation of light switch. Interconnect all smoke detectors within each individual living unit so that if any one or more detectors initiates an alarm then all detectors will indicate an alarm.
- B. Photoelectric detectors shall operate on a multiple cell concept using an LED light source. Failure of the LED shall not cause an alarm condition but shall operate the detector-indicating lamp. Detectors shall be factory set for sensitivity and shall not require field adjustments. Detectors shall be hard wired, and shall **NOT** have battery backup option. Provide units with test switch, 85 dB internal horn, bug screen and relay. Provide quick connect mounting with tamper resistant locking device.

- C. Carbon monoxide detectors shall operate on a multiple station concept with silencer that operates on 120V AC. biometric sensors are combined in a sensorpack module. Dangerous C.O. levels shall trigger an 85db alarm at both low (early warning) and high (full alarm) levels. Silence button shall quiet alarm at both low (early warning) and high (full alarm) levels. Typical Product shall be Air-Guard Item 06020, manufactured by Maple Chase, or equal.

PART 3 – EXECUTION

3.01 INSTALLATION OF WIRING DEVICES AND ACCESSORIES

- A. Install wiring devices and accessories as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with recognized industry practices to fulfill project requirements. Devices shall be secured and supported only to back boxes. Provide metal spacers, that fit around device mounting fasteners, between device and back box to insure proper support and grounding. Support of devices shall not be by surrounding wall, floor, or ceiling surfaces or by covers or plates.
- B. Device, device plates, and trim panels shall be secured to walls level and/or plumb. Installations in floors and ceilings shall be parallel and perpendicular to wall lines. Consistent elevations of device plates or trim panels top edge shall be maintained at location devices as shown or specified or intended to be mounted at the same height.
- C. Coordinate with other work, to interface installation of wiring devices and accessories.
- D. Install wiring devices only in electrical boxes which are clean; free from building materials, dirt, and debris.
- E. Install wiring devices and plates after painting work is completed.
- F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for wiring devices. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A.
- G. Provide isolated ground type wiring devices for devices connected to isolated ground type panelboards and switchboards.
- H. See Section "Cabinets, Boxes, and Fitting for Wiring Device Mounting Heights."
- I. 15 ampere receptacles may be installed on all 15 ampere circuits and on 20 ampere circuits where 2 or more receptacles are installed, unless otherwise noted. On 20 ampere circuits where only a single receptacle is installed or as noted on the drawings, the receptacle shall be a 20 ampere receptacle.
- J. Install watthour meters, where called for, upon substantial completion of the unit.

3.02 PROTECTION

- A. Protect installed components from damage. Replace damaged items prior to final acceptance.

3.03 FIELD QUALITY CONTROL

- A. Testing: Prior to energizing circuits, test wiring for electrical continuity and for short-circuits. Ensure proper polarity of connections is maintained. Test wiring devices and demonstrate compliance with requirements, operating each operable device at least 6 times. Test ground fault interrupter receptacle operation with both local and remote fault simulations in accordance with manufacturer recommendations and applicable codes. Provide a written statement to the Contracting Officer that confirms all testing has been performed and all installations meet the requirements of the contract documents.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16170
CIRCUIT AND MOTOR DISCONNECTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this section.

1.02 SUMMARY

- A. This Section includes circuit and motor disconnects.

1.03 SUBMITTALS

- A. Product data for each type of product specified.
- B. Maintenance data for circuit and motor disconnects, for inclusion in Operation and Maintenance Manual specified in Division 1 and Division 16 Section "Basic Electrical Requirements."

1.04 QUALITY ASSURANCE

- A. Electrical Component Standards: Provide components complying with NFPA 70 "National Electrical Code" and which are listed and labeled by UL. Comply with UL Standard 98 and NEMA Standard KS 1.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
 - 1. ITE, Siemens Energy and Automation, Incorporated.
 - 2. Cutler Hammer/Westinghouse and Eaton Corporation.
 - 3. Square D Company.

2.02 TWO POLE AND THREE PHASE CIRCUIT AND MOTOR DISCONNECT SWITCHES

- A. General: Provide circuit and motor disconnect switches in types, sizes, duties, features, ratings, and enclosures as indicated, if not indicated as required to meet NEC and as suitable for each location. For motor and motor starter disconnect switches, provide units with horsepower ratings suitable to the loads. Series rated devices, equipment and assemblies shall not be provided. IEC rated devices, equipment and assemblies shall not be provided. All rated devices, equipment, and assemblies shall be NEMA rated.
- B. Disconnect switches shall have switch blades which are fully visible in the "OFF" position when the switch door is open. All current carrying parts shall be copper and plated to resist corrosion and promote cool operation. Disconnect switches shall have silver-tungsten type switch contacts. Disconnect switches shall have removable arc suppressers where necessary to permit easy access to line side lugs. Lugs shall be front removable and UL listed for 75 degree C, aluminum or copper wire. Disconnect switches shall be quick-make, quick-break. The operating handle shall be an integral part of the box, not the cover. Provision for padlocking the switch in the "OFF" positions shall be provided. Disconnect switches shall have a cover interlock to prevent unauthorized opening of the switch door when the handle is in the "ON" position. The handle position shall indicate whether the switch is "ON" or "OFF." Disconnect switches shall be UL listed for a minimum of 200,000 RMS symmetrical ampere short circuit rating. Provide fuses in fusible disconnect switches. All disconnect switches shall be of the same manufacturer.
- C. Fusible Disconnect Switches: Heavy duty disconnect switches of classes and current ratings indicated. Switches rated 600 ampere and less shall have pressure type reinforced Type R fuse clips. Switches rated more than 600 ampere shall have mounting provisions for Class L fuses.
- D. Non-fusible Disconnect Switches: Heavy duty disconnect switches of classes and current ratings as indicated.
- E. Service Disconnect Switches: Heavy duty fusible disconnect switches or fusible bolted pressure switches as indicated. UL listed for use as service equipment under UL Standard 98 or 869. Provide fuse provision per requirements of fusible disconnect switches.
- F. HVAC Disconnect Pullout Type, (Residential Condensing Unit):
 - 1. Pullout type disconnects shall be NEMA 3R rainproof and pad lockable.
 - 2. Removable internal shield.
 - 3. Knockouts on back, both sides, and bottom.
 - 4. Unit shall be metallic or nonmetallic as indicated on the drawings.
 - 5. Voltage rating shall be single phase, 2 wire, 240 volts.
 - 6. Current rating and whether fused or nonfused, as indicated on the drawing.
 - 7. UL listed, UL1429.
 - 8. Product based on Bussmann #B22 series or equivalent.

2.03 SINGLE PHASE TWO HORSEPOWER AND LESS MOTOR DISCONNECTS

- A. These motor disconnects shall be of the Heavy Duty Type horsepower rated and selected to match motor per NEC.
- B. These motor disconnects shall be manufactured by Pass & Seymour, Arrow Hart, Hubbell, Bryant, Leviton, General Electric, or equal and all shall be UL approved and listed.

- C. Catalog numbers given are for Hubbell to indicate type and quality. Type with "L" suffix are locking type including key.

<u>Ampere Rating</u>	<u>Horsepower Rating</u>	<u>Single Pole</u>	<u>Double Pole</u>	<u>Three Way</u>	<u>Four Way</u>
15	1/2 HP @ 120V	1201	1202	1203	1204
	2 HP @ 240V	1201-L	1202-L	1203-L	1204-L
20	1 HP @ 120V	1221	1222	1223	1224
	2 HP @ 240V	1221-L	1222-L	1223-L	1224-L
30	2 HP @ 120V	3031A	3032A	3033A	-----
	2 HP @ 240V	3031A-L	3032A-L	3033A-L	-----

2.04 ACCESSORIES

- A. Electrical Interlocks: Provide number and arrangement of interlock contacts in disconnect switches as indicated and as required for a complete installation.

PART 3 – EXECUTION

3.01 INSTALLATION OF CIRCUIT AND MOTOR DISCONNECTS

- A. General: Provide circuit and motor disconnect switches as indicated and as required by codes. Comply with switch manufacturers' printed installation instructions.
- B. Mount disconnect switches securely to building structure in a location that meets the requirements of the NEC. Top of disconnect switch to be 5'-6" above finished floor. Coordinate exact location with other work. When mounting of disconnect switch to the building structure is not possible, mount disconnect switch on a frame fabricated of angled steel. Frame shall be secured to building structure.

3.02 IDENTIFICATION

- A. Identify field-installed wiring and components and provide identification in accordance with Division 16 Section "ELECTRICAL IDENTIFICATION."

3.03 GROUNDING

- A. Provide equipment grounding connections for circuit and motor disconnects.

3.04 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, in accordance with manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.05 FIELD QUALITY CONTROL

- A. Quality Control Program: Conform to the following:
 - 1. Procedures: Make field tests and inspection and prepare circuit and motor disconnect switches for satisfactory operation in accordance with manufacturer's recommendations and these specifications.
- B. Visual and Mechanical Inspection: Include the following inspections and related work:
 - 1. Inspect for defects and physical damage, labeling, and nameplate compliance with requirements of contract documents.
 - 2. Exercise and perform operational tests of all mechanical components and other operable devices.
 - 3. Check mounting, area clearances, and alignment and fit of components.
- C. Testing: Demonstrate capability and compliance with requirements. Except as otherwise indicated, do not test disconnect switches by operating them under load. However, demonstrate disconnect switch operation through six opening/closing cycles with circuit unloaded. Open each disconnect switch enclosure for inspection of interior, mechanical and electrical connections, fuse installation, and for verification of type and rating of fuses installed. Correct deficiencies then retest to demonstrate compliance. Remove and replace defective units with new units and retest. Provide a written statement to the Contracting Officer that confirms all quality control work has been performed and all installations meet the requirements of the Contract Documents.

3.06 CLEANING

- A. Upon completion of installation, inspect interior and exterior of switches. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION

SECTION 16190
SUPPORTING DEVICES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this section.
- C. Related Sections: The following Sections contains requirements that relate to this Section:
 - 1. Division 3 Section "CAST-IN-PLACE CONCRETE" for inserts, anchors, and sleeves to be installed in concrete for use with supporting devices.
 - 2. Division 5 Section "STRUCTURAL STEEL" for requirements for miscellaneous metal items involved in supports and fastenings.
 - 3. Division 7 Section "JOINT SEALERS" for requirements for caulking, and for firestopping at sleeves through walls and floors that are fire barriers.
 - 4. Refer to other Division 16 sections for additional specific support requirements that may be applicable to specific items.

1.02 SUMMARY

- A. This Section includes secure support from the building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Shop drawing indicating details of assembled products and materials.
- D. Registered professional engineering certified shop drawings consisting of details and engineering analysis for supports for the following items:
 - 1. Wall mounted and suspended mounted items and equipment exceeding a weight of 50 pounds.
 - 2. Fixtures not to be supported only by means of the fixture outlet boxes due to load limits.

1.04 QUALITY ASSURANCE

- A. Electrical Component Standard: Component and installation shall comply with NFPA 70 "National Electrical Code."
- B. Electrical components shall be listed and labeled by UL, ETL, CSA, or other approved, nationally recognized testing and listing agency that provides third-party certification follow-up services.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:
 - 1. Slotted Metal Angle and U-Channel Systems:
 - a. B-Line Systems, Incorporated.
 - b. GS Metals Corporation.
 - c. Unistrut Diversified Products.
 - 2. Fasteners and Anchors:
 - a. Hilti Incorporated.
 - b. Phillips Drill, Division of FL Industries.
 - c. Star Expansion Industries.
 - 3. Raceway Supports and Hangers:
 - a. Erico Products Incorporated (Caddy Fasteners).
 - b. Midwest Electric, Division of Cooper Industries, Incorporated.
 - c. OZ/Gedney Company.
 - 4. Conduit Sealing Bushings:
 - a. Killark Electric Manufacturing Company.
 - b. OZ/Gedney Company.
 - c. Thomas & Betts Corporation.

2.02 COATINGS

- A. Coating: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic unless indicated otherwise. Products for use outdoors shall be hot-dip galvanized, or stainless steel.

2.03 MANUFACTURED SUPPORTING DEVICES

- A. Raceway Supports: Clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, minnerallacs, J-hooks, pipe clamps, korn clamps, hanger rod and fittings, U-channel and fittings, caddy type hangers, toggle bolts, expansion anchors, cable supports.
- B. Fasteners: Types, materials, and construction features as follows:
 - 1. Expansion Anchors: Carbon steel wedge or sleeve type.
 - 2. Toggle Bolts: All steel springhead type.
- C. Raceway Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around raceway, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.
- D. Cable Supports for Vertical Raceways: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser raceways. Provide plugs with number and size of conductor gripping holes as required to suit individual risers.
- E. U-Channel Systems: Provide fittings and accessories that mate and match with U-channel and are of the same manufacturer. Provide type and size as required unless indicated otherwise. Provide U-channel without holes or slots.

2.04 FABRICATED SUPPORTING DEVICES

- A. General: Fabricated supports or manufactured supports assembled from U-channel components.
- B. Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.
- C. Pipe Sleeves: Provide pipe sleeves fabricated from schedule 40 galvanized steel pipe.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install supporting devices to fasten electric components securely and permanently in accordance with NEC requirements.
- B. Coordinate with the building structural system and with other work.

- C. Raceway Supports: Comply with the NEC and the following requirements:
1. Conform to manufacturer's recommendations for selection and installation of supports.
 2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least 4. Where this determination results in a safety allowance of less than 200 pounds, provide additional strength until there is a minimum of 200 pounds safety allowance in the strength of each support.
 3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and raceways.
 4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
 5. Support individual horizontal raceways by separate pipe hangers. For hanger rods use 1/4-inch diameter or larger threaded steel. Use fasteners that are specifically designed for supporting single conduits or tubing.
 6. Space supports for raceways in accordance with NEC and as indicated.
 7. Support exposed and concealed raceway within 1 foot of an unsupported box and access fittings.
 8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the raceway supports with no weight load on raceway terminals.
- D. Vertical Conductor Supports: Install simultaneously with installation of conductors. Locate per NEC and as indicated.
- E. Miscellaneous Supports: Support miscellaneous electrical components to produce the same structural safety factors as specified for raceway supports. Install metal U-channel for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.
- F. In open overhead spaces, cast boxes threaded to raceways need not be supported separately except where used for fixture support; support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved type of fastener not more than 24 inches from the box.
- G. Sleeves: Install in concrete slabs and walls and all other fire-rated floors and walls for raceways and cable installations. For sleeves through fire-rated wall or floor construction, apply UL listed firestopping sealant in gaps between sleeves and enclosed conduits and cables in accordance with "Fire Resistant Joint Sealers" requirement of Division 7 Section "JOINT SEALERS."
- H. Conduit Seals: Install seals for conduit penetrations of slabs on grade and exterior walls below grade and as indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.

- I. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with the following:
 1. Fasten by means of wood screws on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine bolts, welded threaded studs, or spring-tension clamps on steel. Do not weld to steel structures unless approval is received from the Contracting Officer.
 2. Holes cut in concrete shall not cut the main reinforcing bars.
 3. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration and shock resistant fasteners for attachments to concrete slabs.
 4. Fasteners and supporting hardware shall not attach to or protrude over the surfaces of studs to which finished material is to be applied.
 5. Tie wire, tie wraps, and similar supports are not acceptable.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16195
ELECTRICAL IDENTIFICATION

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.
- C. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 9 Section "PAINTING" for related identification requirements.

1.02 SUMMARY

- A. This Section includes identification of electrical materials, equipment, and installations. It includes requirements for electrical identification components including but not limited to the following:
 - 1. Buried electrical line warnings.
 - 2. Identification labeling for raceways, cables, and conductors.
 - 3. Operational instruction signs.
 - 4. Warning and caution signs.
 - 5. Equipment labels and signs.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.
- C. Schedule of identification nomenclature to be used for identification signs, labels, and schedules.
- D. Samples of each color, lettering style, and other graphic representation required for identification materials; samples of labels and signs.

1.04 QUALITY ASSURANCE

- A. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."
- B. ANSI Compliance: Comply with requirements of ANSI Standard A13.1, "Scheme for the Identification of Piping Systems," with regard to type and size of lettering for raceway and cable labels.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. LEM Products, Incorporated.
 - 2. Panduit Corporation.
 - 3. Brady Company.

2.02 ELECTRICAL IDENTIFICATION PRODUCTS

- A. Colored Adhesive Marking Tape for Wires, and Cables: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches in width.
- B. Pretensioned Flexible Wraparound Colored Plastic Sleeves for Cable Identification: Flexible acrylic bands sized to suit and arranged to stay in place by pre-tensioned gripping action when coiled around the cable.
- C. Underground Line Marking Tape: Permanent, bright-colored, continuous-printed, plastic tape compounded for direct-burial service not less than 6 inches wide by 4 mils thick. Printed legend indicative of general type of underground line below.
- D. Wire/Cable Designation Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable/conductor markers with preprinted numbers and letters.
- E. Engraved, Plastic-Laminated Labels, Signs, and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8-inch thick for larger sizes. Engraved legend in black letters on white face except black letters on red face for emergency equipment and punched for mechanical fasteners if to be installed with mechanical fasteners.
- F. Baked-Enamel Warning and Caution Signs for Interior Use: Preprinted aluminum signs, punched for fasteners, with colors, legend, and size appropriate to the location.
- G. Exterior Metal-Backed Butyrate Warning and Caution Signs: Weather-resistant, nonfading, preprinted cellulose acetate butyrate signs with 20-gage, galvanized steel backing, with colors, legend, and size appropriate to the location. Provide 1/4-inch grommets in corners for mounting.

- H. Fasteners for Plastic Laminated and Metal Labels, Signs and Instruction Plates: Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts, flatwashers and lock washers. Secure with adhesive at locations that fasteners should not penetrate the substrate.
- I. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50 pound minimum tensile strength, and suitable for a temperature range from minus 50 degree F to 350 degree F.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified and indicated. Install numbers, lettering, and colors as approved in submittals and as required by code.
- B. Install identification devices in accordance with manufacturer's written instructions and requirements of NEC.
- C. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- D. Conduit Identification:
 - 1. Identify high-voltage feeder conduits (over 600 V) by words "DANGER-HIGH VOLTAGE" in black letters 2 inches high, stenciled at 10-foot intervals over continuous painted orange background.
 - 2. The following areas shall be identified:
 - a. On surface of exposed conduits.
 - 3. Apply identification to areas as follows:
 - a. Clean surface of dust, loose material, and oily films before painting.
 - b. Prime surfaces: For galvanized metal, use single-component acrylic vehicle coating formulated for galvanized surfaces.
 - c. Apply one intermediate and one finish coat of orange silicone alkyd enamel.
 - d. Apply primer and finish materials in accordance with manufacturer's instructions.
- E. Identify Junction, Pull, and Connection Boxes: Code-required caution sign for boxes shall be pressure-sensitive, self-adhesive label indicating system voltage in black, preprinted on orange background. Install on outside of box cover. Identification shall be provided per codes.
- F. Underground Electrical Line Identification: During trench backfilling, for exterior underground power, signal, and communications lines, install continuous underground plastic line marker, located directly above line at 12 inches below finished grade. Where multiple lines are installed in a common trench or concrete envelope install multiple line markers on 24 inch center lines.

- G. Install line marker for underground wiring, both direct-buried and in raceways whether or not concrete encased.
- H. Conductors at padmounted transformers shall be labeled as follows:
1. Primary conductors shall be labeled with the phase letter, and where it is served from or to.
 2. Secondary conductors shall be labeled as to which unit, or street address it serves.
- I. Conductors at sectionalizing cabinets shall be labeled as follows:
1. Primary conductors shall be labeled with the phase letter, and where it is served from or to.
- J. Conductor Color Coding: Provide color coding for conductors throughout the project electrical system as follows:
1. Color code No. 10 AWG and smaller conductors with factory applied color. Color code No. 8 AWG and larger conductors using colored electrical tape. Color coding shall occur at all conductor termination points and in all junction boxes and pull boxes. Conductors No. 8 AWG and larger shall have black colored insulation. Colored electrical tape shall be Minnesota Mining and Manufacturing Company "Scotch Brand 35."

<u>Phase</u>	<u>1 phase, 3 wire</u>	<u>240/120 Volts</u>
A	Black	
B	Red	
Neutral	White	
Ground	Green	
ISO Ground	Green with yellow tracer/band	

2. Apply colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in junction boxes and pull boxes. Apply the last two laps of tape with no tension to prevent possible unwinding. Do not obliterate cable identification markings by taping. Tape locations may be adjusted slightly to prevent such obliteration.
- K. Tag or label conductors as follows:
1. Future Connections: Conductors indicated to be for future connection or connection under another contract with identification indicating source and circuit numbers.
 2. Multiple Circuits: Where multiple branch circuits or control wiring or communications/signal conductors are present in the same box or enclosure, label each conductor or cable. Provide legend indicating source, voltage, circuit number, and phase for branch circuit wiring. Phase and voltage of branch circuit wiring may be indicated by means of coded color of conductor insulation. For control and communications/signal wiring, use color coding or wire/cable marking tape at terminations and at intermediate locations where conductors appear in boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tapes.

3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.

- L. Apply warning, caution, and instruction signs and stencils as follows:
1. Install warning, caution, or instruction signs where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install butyrate signs with metal backing for outdoor items.
 2. Emergency Operating Signs: Install engraved laminate signs with black lettering on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, or other emergency operations.
- M. Install equipment/system circuit/device identification as follows:
1. Apply equipment identification labels of engraved plastic-laminate on each unit of electrical equipment in building. This includes, but is not limited to, power, lighting, audio, video, control, communication, signal and alarm systems, unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, with 1/2-inch high lettering on 1-1/2-inch high label (2-inch high where 2 lines are required), black lettering in white field except black lettering in red field for emergency equipment. Text shall match terminology and numbering of the Contract Documents and shop drawings. Apply labels for each unit of the following categories of electrical equipment. Text shall include equipment name and circuit identification.
 - a. Panelboards.
 - b. Access doors and panels.
 - c. Disconnects.
 - d. Transformers.
- N. Install labels at locations indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

END OF SECTION

SECTION 16321

SINGLE PHASE PAD-MOUNTED TRANSFORMERS

PART 1 – PRODUCTS

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This section includes distribution and power transformers with medium-voltage primaries. Types of transformers specified in this Section include the following:
 - 1. Liquid-filled, pad-mounted, single phase.

1.03 DEFINITIONS

- A. Listed: As defined in the “National Electrical Code,” Article 100.

1.04 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each product specified, including dimensioned plans, sections, and elevations. Show minimum clearances and installed devices and features.
- C. Wiring diagrams of transformers and accessory components, differentiating between manufacturer-installed and field-installed wiring.
- D. Product certificates signed by manufacturers certifying that their products comply with the specified requirements.
- E. Qualification data for firms and persons specified in the “Quality Assurance” Article to demonstrate their capabilities and experience. Include a list of relevant completed projects with project names and addresses, and names and addresses of the respective contacts and references.
- F. Product Test Reports: Certified copies of manufacturer’s design and routine factory tests required by the referenced standards.
- G. Operation and maintenance data for materials and products to include in the “Operating and Maintenance Manual” specified in Division 1.

- H. Field test reports of tests and inspections conducted according to Part 3 of this Section.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer of medium-voltage electrical distribution equipment to perform the installation specified in this Section. Refer to Division 1 Section "Reference Standards and Definitions" for definition of an experienced Installer.
- B. Field Testing Agency Qualifications: To qualify for acceptance, the testing agency must demonstrate, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated.
- C. Comply with NFPA 70 "National Electrical Code."
- D. Comply with IEEE C2 "National Electrical Safety Code."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Cooper Industries.
 - 2. Federal Pacific Transformer Co.
 - 3. General Electric Co.
 - 4. Hevi-Duty Electric.
 - 5. Rapid Power Technologies, Inc.
 - 6. Siemens Energy & Automation, Inc.
 - 7. Square D Co.

2.02 TRANSFORMERS, GENERAL

- A. Windings: Two-winding type, designed for operation with high-voltage windings connected to one (1) phase, one (1) wire, 60 Hz, grounded neutral distribution system.

2.03 WINDINGS

- A. Copper or aluminum.

2.04 SINGLE PHASE LIQUID-FILLED PAD-MOUNTED TRANSFORMERS

- A. Comply with IEEE C57.12.26 and C57.12.28 and with the following features and ratings.
- B. Insulating Liquid: Mineral oil, conforming to ASTM D 3487 "Specifications for Mineral Insulating Oil Used in Electrical Apparatus." Type II tested according to ASTM D 117 "Guide to Test Methods and Specifications for Electrical Insulating Oils of Petroleum Origin."

- C. Single compartment shall be "Type 1" as defined by ANSI C57.12.25 with combination high- and low-voltage compartment. Compartment shall be of the "Clam-Shell" type with lockable (having pad-locking provisions) hinged cover and single-point latching.
- D. High-voltage portion shall contain the incoming line, insulated high-voltage load-break connectors, bushing well inserts, 2 high-voltage bushing wells configured for loop feed application, access to dry-well fuse canisters, dead-front surge arresters, external tap changer handle, connector parking stands with insulated standoff bushings, and ground pad.
 - 1. Insulated high-voltage load-break connectors: IEEE 386, rated 15 kV, 95 kV BIL. Current rating: 200 amperes rms continuous. Short time rating: 10,000 amperes rms symmetrical for a time duration of 0.17 seconds. Connectors and inserts shall be the product of a single manufacturer. Connector shall have a steel reinforced hook-stick eye, grounding eye, test point, and arc-quenching contact material.
 - 2. Bushing well inserts: IEEE 386, 200 amperes, 15 kV Class. Provide a bushing well insert for each bushing well unless indicated otherwise.
 - 3. Current-limiting, in series with Bay-O-Net Type expansion fuses, dry-well mount: ANSI C37.47. Provide fuses in air-insulated, oil-sealed, dead-front, non-load-break dry-well fuse canisters, on the load side of the bushings serving the transformer. Fuses shall remove the transformer from service in case of an internal fault. Size fuses to approximately 150 percent of the transformer primary full load current rating and in accordance with fuse manufacturer's recommendations for dry-well mounting. Fuses shall have an interrupting rating of 50,000 rms amperes symmetrical at the system voltage specified. Furnish a spare fuse for each fuse provided.
 - 4. Surge Arresters: ANSI/IEEE C62.11, rated 9 kV, fully shielded, dead-front metal-oxide-varister, elbow type with resistance-graded gap suitable for plugging into bushing well inserts. Provide one arrester for each radial feed circuits.
 - 5. Parking Stands: Provide a parking stand near each bushing well.
- E. Low-voltage portion shall contain low-voltage bushings with NEMA spade terminals, accessories, stainless steel diagrammatic transformer nameplate, and ground pad.
 - 1. Accessories shall include drain valve with sampler device, fill plug, pressure relief device.
 - 2. Low voltage spades shall be of sufficient length to accommodate all secondary conductors terminated at the transformers. Secondary conductors shall be terminated back to back on opposite sides of a spade. "Piggy backing" of secondary conductor lugs on the same side as a secondary spade shall not be permitted.
- F. Transformer Type and Ratings
 - 1. Oil-insulated, two winding, 60 hertz, 65 degrees C rise above a 20 degrees C average ambient, self-cooled type.
 - 2. Transformer voltage ratings: 7620 V
 - 3. 240/120 V.
 - 4. Tap changer shall be externally operated, manual type for changing tap setting when the transformer is de-energized. Provide four 2.5 percent full capacity taps, two above and two below rated primary voltage.
 - 5. Transformer shall have the following characteristics:

<u>KVA</u>	<u>BIL (KV)</u>	<u>Min. Tested Imp. (% at 85 Deg C)</u>	<u>DB (MAX)</u>
75	95	1.6	51
100	95	1.6	51

167 95 1.8 55

6. Transformer shall include lifting lugs and provisions for jacking under base. The transformer base construction shall be of the fabricated type and suitable for using rollers or skidding in any direction. Transformer shall have its kVA rating conspicuously displayed on its enclosure. The transformer shall have an insulated low-voltage neutral bushing with lugs for ground cable, and with removable ground strap.

- G. No-load losses (NLL) in watts at 20 degrees C, and load losses (LL) in watts at 85 degrees C, shall be as follows:

<u>KVA</u>	<u>"NLL"</u>	<u>"LL"</u>
75	40	775
100	55	1025
167	90	1725

- H. Submit certification from the manufacturer, with the design test submittal, to show conformance with the specified NLL and LL. The values for the specified losses shall be used for comparison with the losses determined during the routine tests. If the routine test values differ from the specified values by more than the tolerance allowed by Table 19 in ANSI/IEEE C57.12.00, the transformer is unacceptable.

2.05 CORROSION PROTECTION

- A. Bases and cabinets of transformers shall be corrosion resistant and shall be steel conforming to ANSI C57.12.28. Paint bases, cabinets, and tanks Munsell 7GY3.29/1.5 green. Paint coating system shall comply with ANSI C57.12.28 regardless of base, cabinet, and tank material. The Munsell color notation is specified in ASTM D 1535.
- B. Hinge pins and barrels, and fully recessed lifting provisions shall be stainless steel.

2.06 SOURCE QUALITY CONTROL

- A. Factory Tests: Design and routine tests conform to the referenced standards.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Comply with IEEE Standard C2, "National Electrical Safety Code" and the manufacturer's written installation instructions:
- B. Identify transformers and install warning signs according to Division 16 Section "Electrical Identification."
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.02 GROUNDING

- A. NFPA 70 and ANSI C2, except that grounding systems shall have a resistance to solid earth ground not exceeding 5 ohms.
- B. Grounding Electrodes: Provide driven ground rods as specified in Section "Groundings." Connect ground conductors to the upper end of ground rods by exothermic weld or compression connector. Provide compression connectors at equipment end of ground conductors.
- C. Pad-Mounted Transformer Grounding: Provide separate copper grounding conductors and connect them to the ground loop as indicated. When work in addition to that indicated or specified is required to obtain the specified ground resistance, the provision of the contract covering "Changes" shall apply.
- D. Make joints in grounding conductors and loops by exothermic weld or compression connector. Exothermic welds and compression connectors shall be installed as specified in Section 16301, "Underground Electrical Work," paragraph entitled "Grounding Connections."
- E. Grounding and Bonding Equipment: UL 467, except as indicated or specified otherwise. Provide a 1/0 bare copper-ground girdle around transformer. Girdle shall be buried one foot deep and placed 3 feet laterally from the transformer enclosure. Connect girdle to enclosure at two opposite places using 1/0 copper. Exothermically weld joints.

3.03 FOUNDATION FOR EQUIPMENT AND ASSEMBLIES

- A. Where drawings indicate that transformers are mounted on a concrete slab, the slab shall be at least 8 inches thick, reinforced with a 6 x 6 – W2.9 x W2.9 mesh placed uniformly 4 inches from the top of the slab. Slab shall be placed on a 6-inch-thick, well-compacted gravel base. The top of the concrete slab shall be approximately 4 inches above the finished grade. Edges above grade shall have 1/2-inch chamfer. The slab shall be of adequate size to project at least 8 inches beyond the equipment. Provide conduit turnups and cable entrance space required by the equipment to be mounted. Seal voids around conduit openings in slab with water- and oil-resistant caulking or sealant. Cut off and bush conduits 3 inches above slab surface. Concrete work shall be as specified in Section "Cast-In-Place Concrete."
- B. Where means other than concrete pad is to be used, such as a manufactured transformer box, installation shall be in complete compliance with manufacturer's recommendations.

3.04 FIELD QUALITY CONTROL

- A. Pretesting: After completing system installation, perform the following preparations for tests:
 - 1. Make insulation-resistance tests for transformers.
 - 2. Make a continuity test for windings and remote alarm circuits.
 - 3. Provide a set of Contract Drawings to the testing agency.
 - 4. Provide manufacturer's installation and testing instructions to the testing agency.
- B. Test Objectives: To ensure transformer installation complies with Contract Documents, is operational within industry and manufacturer's tolerances, and is suitable for energizing.

- C. Test Labeling: Upon satisfactory completion of tests for each transformer, attach a dated and signed "Satisfactory Test" label to the unit.
- D. Schedule tests and provide notification to Contracting Officer at least one week in advance of test commencement.
- E. Report: Submit a written report of observations and tests to Contracting Officer. Report defective materials and workmanship.
- F. Tests: Include the following minimum inspections and tests according to the manufacturer's instructions. For test method and date correction factors, conform to IEEE Standard Test Codes C57.12.90 for liquid-filled units, and IEEE C57.12.91 for dry-type units.
1. Inspect accessible components for cleanliness, mechanical, and electrical integrity, for presence of damage or deterioration, and to ensure removal of temporary shipping bracing. Do not proceed with tests until deficiencies are corrected.
 2. Inspect bolted electrical connections for tightness according to manufacturer's published torque values or, where not available, those of UL Standards 486A and 486B.
 3. Insulation Resistance: Perform megohmmeter test of primary and secondary winding-to-winding and winding-to-ground according to the following
- | WINDING
RATING
(VOLTS) | MINIMUM
TESTS
VOLTS (dc) | MINIMUM INSULATION
RESISTANCE (MEGOHMS)
LIQUID FILLED |
|------------------------------|--------------------------------|---|
| 0 – 600 | 1,000 | 100 |
| 601 – 5,000 | 2,500 | 1,000 |
| 5,000 – 35,000 | 5,000 | 5,000 |
- a. Duration of each test: 10 minutes.
 - b. Temperature Correction: Correct results for test temperature deviation from 20 deg C standard.
4. Turns Ratio: Measure between windings at each tap setting. Measured ratios deviating more than 0.5 percent from the calculated ratio or the measured ratio for adjacent coil are not acceptable.
 5. Winding Resistance: Measure for winding at nominal tap setting. Measured resistance deviating more than 1 percent from that of adjacent winding is not acceptable.
- G. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest. Verify that transformers meet specified requirements.

3.05 ADJUSTING

- A. After completing installation and cleaning, touch up scratches and mars on finish to match original finish.
- B. Adjust transformer taps to provide optimum voltage conditions at utilization equipment throughout the normal operating cycle of the facility. Record voltages and tap settings to submit with test results.

3.06 DEMONSTRATION

- A. Training: Arrange and pay for the services of a factory-authorized service representative to demonstrate transformers and accessories and train Government staff. Include a minimum of 8 hours of training in operation and maintenance. Provide both classroom training and hands-on equipment operation covering the following:
1. Safety precautions.
 2. Features and construction of project transformers and accessories.
 3. Routine inspection, test and maintenance procedures.
 4. Routine cleaning.
 5. Features, operation, and maintenance of integral disconnect and protective devices.
 6. Interpretation of readings of indicating and alarm devices.
 7. Fuse selection.
 8. Protective relay setting considerations.
 9. Features, operation and maintenance of separable insulated connector system.
 10. Tap-changing procedures.
- B. Schedule training with at least 7 days advance notice.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16322

MEDIUM-VOLTAGE SECTIONALIZING CABINET

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes medium-voltage switchgear and associated auxiliary equipment.
- B. Related Sections: The following Section contains requirements that relate to this Section.
 - 1. Division 16 Section "Medium-Voltage Cables" for cable terminations at sectionalizing cabinet.
 - 2. Division 16 Section "Grounding".

1.03 SUBMITTALS

- A. General: Submit each item in this article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each component.
- C. Shop drawings for each cabinet assembly and major system component. Include dimensioned plans, sections, and elevations showing minimum clearances, installed devices, major features, and material lists.
- D. Wiring diagrams, both elementary and schematic, differentiating between manufacturer-installed and field-installed wiring. Include single-line diagram of switchgear bus and component connections.
- E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project names, addresses, names of architects and owners, and other information specified.
- F. Field test reports indicating and interpreting test results relative to compliance with specified requirements.
- G. Maintenance data for materials and products to include in the operating and maintenance manual specified in Division 1.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who had successfully installed medium-voltage switchgear.
- B. Manufacturer Qualifications: Firm experienced in manufacturing electrical products similar to that indicated for this Project and that has a record of successful in-service performance.
- C. Comply with NFPA 70, "National Electrical Code."
- D. Comply with IEEE C2, "National Electrical Safety Code."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Fiberglass Sectionalizing Cabinets:
 - a. Nordic Fiberglass
 - b. Kearney-National.
 - c. RTE.
 - d. Cooper Power System.

2.02 RATINGS AND CONDITIONS

- A. System Configuration: Sectionalizer suitable for application on 3-phase, 60-Hz, grounded-neutral system.
- B. System Voltage: 7.2 kV nominal; 15 kV maximum.

2.03 SECTIONALIZING CABINET CONSTRUCTION

- A. Resin to be a neat and not a distressed polyester thermosetting resin. The material shall be tested for flammability under ASTM-D635 with a rating to be self-extinguishing and with an extent of burning not to be over 12MM nor average time burning to be over eighty seconds on test.
- B. Fiberglass used will be a combination of chopped glass with a minimum of one layer throughout of 18 ounce woven roving so as to form a continuous filament from top to bottom and from one side to the other for maximum strength. The overall laminate thickness to be 1/4" throughout the base, 1/4" around the perimeter around the perimeter of the cover and 3/16" throughout the remaining area of the cover.
- C. The exterior surface shall be coated with a Isophthalic base gelcoat or surface coat that will provide maximum protection from UV light.

- D. The base section of the Primary sectionalizing enclosures shall be molded in one piece as to form a unitized body construction between the equipment mounting board and the ground sleeve section of the base. The ground sleeve section of the enclosure shall be reinforced in a manner to eliminate sidewall deflection. The cover will be attached using a continuous hinge. The locking system shall incorporate the means for a penta-head, hasp and padlock. The enclosures will be meeting all of the requirements specified by the REA as specified by the ANSI C 57 12.28 standards for enclosure security. All hardware will be produced from 304 series stainless steel with the exception of the mounting plates and lifting eyes. The mounting plates will be stainless steel plates. The lifting eyes shall be zinc plated and have two located in the back and one in the front to allow for a three point lift. The base flange will be a minimum of 3 1/2" to provide a stable base when installed. The three phase enclosures shall have a positive lock prop arm on one side and non-locking prop arm on the opposite side. The single phase shall have one positive lock prop arm. The mounting plates shall be fastened individually and must be removable. Each mounting plate will come standard with 2 parking stands and a predrilled bolting pattern to allow for 2, 3, or 4 point 200 amp junction in either 15 or 25 KV from various manufacturers. Each plate will also have two 1/2" nuts welded to the plate from ground points.

2.04 INTERNAL ELECTRICAL TERMINATING DEVICES

- A. Internal electrical terminating equipment shall be in compliance with components described in Division 16 Section "Medium-Voltage Cables".

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install sectionalizing cabinet and accessory items according to manufacturer's written installation instructions and the following specifications.
- B. Minor variations in location shall be permitted to accommodate field conditions..
- C. Anchor sectionalizing cabinet to concrete pad using only methods approved by the manufacturer.
- D. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets, and temporary blocking of moving parts from switchgear units and components.

3.02 IDENTIFICATION

- A. Identify field-installed wiring and components and provide warning signs according to Division 16 Section "Electrical Identification."

3.03 GROUNDING

- A. Connections: Ground electrical.

3.04 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where these values are not indicated, use those specified in UL 486A and UL 486B.

3.05 FIELD QUALITY CONTROL

- A. Testing: After installing switchgear and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
 - 1. Procedures: Perform inspections and tests specified below. Report values that do not meet manufacturer's recommendations. Certify compliance with test parameters.
 - 2. Surge Arresters: Perform inspections and tests stated in NETA ATS, Section 7.19.
- B. Remove and replace malfunctioning units with new units, and retest.

3.06 MANUFACTURER TEST DATA

- A. Provide weathering test data results from DSET Laboratories using the EMMAQUA test method with the results of the equivalent of two standard ultra-violet light years showing no change in Fiber Show or Fiber Bloom and no worse than a "Good" rating on General Appearance and Color Change. An alternate test for UV resistance can be the ASTM-G-70 test method with a maximum of change of 2.3 MacAdam Units after one thousand hours of exposure in a model 65WR Atlas Weatherometer.

3.07 CLEANING

- A. Inspect interior and exterior of installed cabinet. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION

SECTION 16370

OVERHEAD ELECTRICAL WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The most recent version of publications listed below, and herein, form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Not all products may be specified for this project.
1. ANSI C2: National Electrical Safety Code.
 2. ANSI C57.12.20: Transformers & Overhead-Type Distribution Transformers, 500 kVA and Smaller; High-Voltage, 34 500 Volts and Below; Low-Voltage, 7970/13 800Y Volts and Below.
 3. ASTM A 475: Zinc-Coated Steel Wire Strand.
 4. ASTM B 1: Hard-Drawn Copper Wire.
 5. ASTM B 2: Medium-Hard-Drawn Copper Wire.
 6. ASTM B 3: Soft or Annealed Copper Wire.
 7. ASTM B 8: Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
 8. ASTM B 228: Concentric-Lay-Stranded Copper-Clad Steel Conductors.
 9. ASTM B 231: Concentric-Lay-Stranded Aluminum 1350 Conductors.
 10. ASTM B 232: Concentric-Lay-Stranded Aluminum Conductors, Coated-Steel Reinforced (ACSR).
 11. ASTM B 397: Concentric-Lay-Stranded Aluminum-Alloy 5005-H19 Conductors.
 12. ASTM B 399: Concentric-Lay-Stranded Aluminum-Alloy 6201-T81 Conductors.
 13. AWPA C1: All Timber Products & Preservative Treatment by Pressure Processes.
 14. AWPA C4: Poles & Preservative Treatment by Pressure Processes.
 15. NEMA WC 5: Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 16. NEMA WC 7: Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 17. NEMA WC 8: Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 18. NETA ATS: Electrical Power Distribution Equipment and Systems.
 19. NFPA 70: National Electrical Code.
 20. REA 43-5: List of Materials Acceptable for Use on Systems of REA Electrification Borrowers.
 21. REA 50-17: Wood Crossarms (Solid and Laminated), Transmission Timber and Pole Keys (DT-5B: PE-16).
 22. UL 6 1993: Rigid Metal Conduit.
- B. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- C. Requirements specified in other Division 16 Sections apply to this Section.

1.02 RELATED REQUIREMENTS

- A. "Basic Electric Materials and Methods" applied to this Section with additions and modifications specified herein.

1.03 SUBMITTALS

- A. Submit the following in accordance with the Section, "Submittals."
 - 1. Manufacturer's Catalog Data.
 - a. Insulators.
 - b. Cutouts.
 - c. Surge arresters.
 - d. Guy strand.
 - e. Anchors.
 - f. Terminator, porcelain housed.
 - g. Transformers.
 - h. Stirrup.
- B. Statements
- C. SD-10, Test Reports.
 - 1. Wood poles and wood crossarms. Furnish an inspection report stating that offered products comply with applicable AWPAs and REA standards. The REA approved Quality Mark "WQC" on each pole and crossarm will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWPAs treatment standards.
- D. Design Tests.
 - 1. Temperature rise.
 - 2. Lightning impulse tests.
 - 3. Lifting and moving devices.
 - 4. Pressure.
- E. Field Test Reports.
 - 1. Ground rod tests.
 - 2. High voltage cable test.
 - 3. Transformer field tests.
 - 4. Large overhead systems test.
- F. Certificates.
 - 1. Submit manufacturer's certificate that each transformer contains less than 1 ppm of PCB at shipment for this contract.
 - 2. Design tests.

G. Records.

1. Transformer test schedule.

1.04 QUALITY ASSURANCE

A. Modification of References.

1. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the authority having "jurisdiction," or words of similar meaning, to mean the Contracting Officer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle poles held in storage more than two (2) weeks in accordance with ANSI O5.1. Exception, do not use pointed tools capable of producing indentations of more than one inch in depth. Nails and holes are not permitted in top of poles.

1.06 SCHEDULING

- A. Notify the Contracting Officer in writing at least 15 days prior to date connections are required. Obtain approval before interrupting service.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Consider materials specified herein or shown on contract drawings which are identical to materials listed in REA 43-5 as conforming to requirements.

2.02 WOOD POLES

- A. Wood poles machine trimmed by turning, Douglas Fir (class 2) conforming to ANSI O5.1 and REA 50-18. Gain, bore, and roof poles before treatment. Pressure treat poles with creosote. The quality of each pole shall be ensured with "WQC" (wood quality control) brand on each piece, or by an approved inspection agency report.

2.03 WOOD CROSSARMS

- A. Conform to REA 50-17. Pressure treat crossarms with ammoniacal copper arsenite (ACA). Treatment shall conform to AWPA C25.
- B. Crossarm Braces
 - 1. Provide as indicated steel angle for 28-inch span with 8-foot crossarms.

2.04 HARDWARE

- A. Hot dip galvanized conforming to ASTM A 153.

2.05 INSULATORS

- A. Provide wet-process porcelain insulators which are radio interference free.
- B. Line Post Type Insulators: ANSI C29.7, Class 57.1.
- C. Suspension Insulators: ANSI C29.2, Class 2/52.1.
- D. Spool Insulators: ANSI C29.3, Class 53.2.
- E. Guy Strain Insulators: ANSI C29.4, Class 53.2.
- F. Pin Insulators: ANSI C29.5, Class 55.5.

2.06 GUY STRAND

- A. ASTM A 475, high-strength extra-high strength, Class A or B, galvanized strand steel cable. Guy strand shall be 3/8 inch in diameter with a minimum breaking strength of 6,000 pounds. Guy strand type and size shall be automatic factory-formed three-bolt clamp indicated guy terminations designed for use with the particular strand and developing at least the ultimate breaking strength of the strand.

2.07 ROUND GUY GUARDS

- A. Vinyl or PVC material, yellow colored, 8 feet long, and shatter resistant at sub-zero temperatures.
- B. Guy attachment shall be thimble eye guy attachment.

2.08 ANCHORS AND ANCHOR RODS

- A. Anchors shall be plate anchors presenting holding area indicated on drawings as a minimum. Anchor rods shall be twin thimble-eye, 3/4 inch diameter by 8 feet long. Anchors and anchor rods shall be hot dip galvanized.
- B. Screw type anchors having a manufacturer's rating of not less than 400 pounds in loose to medium sand/clay soil, Class 6 at least equal to rating indicated, and extra heavy pipe rods conforming to ASTM A 53, Schedule 80, and couplings conforming to ASME B16.11, fitting Class 6000.
- C. Plate anchors shall have a minimum area of 250 square inches and rated by manufacturer for 300 pounds or more in soils classified as medium dense coarse sand and sandy gravels; firm to stiff clays and silts.

2.09 GROUND RODS AND WIRE

- A. Copper clad steel ground rods at least 3/4 inch in diameter and 10 feet long. Die-stamp each near top with name or trademark of manufacturer and length of rod in feet. Rods shall have a hard, clean, smooth, continuous surface throughout length of rod.
- B. Provide soft drawn copper wire ground conductors a minimum No. 4 AWG. Ground wire protectors may be either PVC or half round wood molding. Wood molding shall be fir, pressure treated in accordance with AWPA C25, or shall be cypress or cedar.

2.10 SURGE ARRESTERS

- A. Rating of lightning (surge) arresters should be 80 percent of the nominal line-to-line voltage of grounded neutral systems or 100 percent of the nominal line-to-line voltage for ungrounded systems, or the next standard rating above those values. (See ANSI C62.2 for standard ratings). External air gap is not normally acceptable.
- B. IEEE C62.1, valve type or ANSI/IEEE C62.11, metal oxide surge arresters arranged for crossarm mounting. Rms rating shall be 12 kV or less.

2.11 FUSED CUTOUTS

- A. Open-type fused cutouts rated 100 amperes and 14,000 amperes symmetrical interrupting current at 15 kV ungrounded, conforming to ANSI C37.42. Type K fuses conforming to ANSI C37.42 with ampere ratings as indicated equal to 150 percent of the transformer full load rating. Open link type and fuse cutouts are not acceptable.

2.12 CONDUIT RISERS AND CONDUCTORS

- A. Rigid galvanized steel conduit conforming to UL 6.
- B. 600-volt secondary riser conductors shall be copper, THWN conforming to UL 83 RHW-USE conforming to UL 854, or as specified on the drawings or elsewhere herein.
- C. Primary riser conductors for 12.47 kV distribution system shall be as specified in Section, "Medium Voltage Cable."

2.13 CABLE TERMINATIONS

- A. Provide terminators for solid insulation nonmetallic jacketed cables of porcelain insulator type. Apply terminators to single conductor cables or to each conductor of multiple conductor cables. Provide terminator and components from one manufacturer and furnished in a package or kit form compatible with insulation and conductor material. The kit shall include complete assembly and installation instructions. The terminator shall comply with requirements of IEEE 48 Class 1 except that requirements of design tightness test need not be met. The terminator shall not extrude filler compound under either test or service. Terminator shall consist of a porcelain insulator, cable connector-hoodnut assembly and aerial lug as required, metal body and support bracket, sealed cable entrance, and internal stress relief device for shielded cable, and insulating filler compound or material.
- B. The terminator, as specified herein, shall be provided for terminating single conductor, or the single conductor of multiconductor, solid insulated, nonmetallic jacketed type cables for service voltage up to 35 kV outdoor. The terminator shall be the product of one manufacturer who shall furnish components in the form of a kit, including complete instructions which shall be followed for assembly and installation, suitable for the type and materials of the cable terminated. The terminator shall conform to IEEE 48 for Class 1 terminations. The terminator shall include stress relief, ground clamp, nontracking rubber skirts, crimp-on connector, rubber cap, and aerial lug. Separate parts of copper or copper alloy shall not be used in contact with aluminum or aluminum alloy parts in the construction and installation of the terminator.
- C. IEEE 48, Class 1. Provide termination as specified herein for terminating single conductor, or the single conductors or multiconductor, solid insulated, nonmetallic jacketed type cables for service voltage up to 35 kV indoor and outdoor. Termination shall be rated for continuous operation at 90 degree C, with an emergency overload temperature rating of 130 degree C. Terminator shall be a one-piece design, where high-dielectric constant (capacitive) stress control is integrated within a skirted insulator made of silicone rubber, munsell gray in color. Termination shall not require heat or flame for installation. Termination kit shall contain all necessary material (except for the lugs) required to make three terminations. Termination shall be designed for installation in low or highly contaminated indoor and outdoor locations.

2.14 TRANSFORMER, POLE TYPE

- A. ANSI C57.12.20.
- B. Single-phase, self-cooled, 65 degrees C continuous temperature rise, two winding, 60 Hertz.
- C. Insulating liquid:
 - 1. ASTM D 3487, Type II, testing in accordance with ASTM D 117.
 - 2. Provide identification of transformer as "non-PCB" on the nameplate.
- D. Ratings:
 - 1. kVA: 75 or as noted on the drawings.
 - 2. BIL: 95 kV.
 - 3. Primary voltage: 7.2 kV or as noted on the drawings.
 - 4. Secondary voltage: 120/240 volts.
 - 5. Impedance: 1.8 percent (minimum).
- E. Single-phase connections:
 - 1. Connect primary: phase-to-ground.
 - 2. Provide transformer with one (1) high-voltage bushing.
- F. Provide four 2 1/2 percent full capacity taps, two taps above and two below rated primary voltage.
- G. Tank finish coat shall be light grey, ANSI Color No. 70.
- H. Show transformer kVA capacity using 2 1/2-inch Arabic numerals placed near the low-voltage bushings.

2.15 ELECTRICAL TAPES

- A. Tapes shall be UL listed for electrical insulation and other purposes in wire and cable splices. Terminations, repairs, and miscellaneous purposes, electrical tapes shall comply with UL 510.

2.16 CAULKING COMPOUND

- A. Compound for sealing of conduit risers shall be of a puttylike consistency workable with hands at temperatures as low as 35 degrees F, shall not slump at a temperature of 300 degrees F, and shall not harden materially when exposed to air. Compound shall readily caulk or adhere to clean surfaces of the materials with which it is designed to be used. Compound shall have no injurious effects upon the workmen or upon the materials.

2.17 SOURCE QUALITY CONTROL

A. Routine and Other Transformer Tests

1. Perform ANSI/IEEE C57.12.00 and ANSI/IEEE C57.12.90 tests on the actual transformer prepared for this project.
2. Submit certified copies of test reports, by serial number, and receive approval before delivery of equipment to the project site.
3. Lightning impulse test:
 - a. ANSI/IEEE C57.98 and ANSI/IEEE C57.12.90.
 - b. State test voltage levels.
 - c. Provide oscillograms with test report.
 - d. Test 20 percent of transformers provided by this contract as selected by a representative of the Government.

B. Design Tests.

1. ANSI/IEEE C57.12.80, Section 5.1.2 states that "design tests are made only on representative apparatus of basically the same design." Submit design test reports with catalog data and drawings for each of the specified transformers. Design tests must have been conducted within five years of the date of award of this contract.
 - a. Tests shall be certified and signed by a registered Professional Engineer.
 - b. ANSI/IEEE C57.12.00 and ANSI/IEEE 57.12.90 tests performed on a prototype transformer will be acceptable.
 - c. Temperature rise: "Basically the same design" for the temperature rise test means a pole type transformer with the same coil construction (strip, layer, or disk), the same kVA, the same cooling type, (OA), the same insulation class, and the same insulating liquid as the transformer specified.
 - d. Lightning impulse test report: "Basically the same design" for the lightning impulse dielectric test means a pole type transformer with the same BIL, the same coil construction (strip, layer, or disk), and a tap changer (if specified).
 - 1) ANSI/IEEE C57.98 and ANSI/IEEE C57.12.90.
 - 2) State test voltage levels.
 - 3) Provide oscillograms with test report.

- C. Lifting and moving devices: "Basically the same design" for the lifting and moving devices test means a pole type transformer in the same weight range as the transformer specified.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Pole Setting:

1. Provide pole holes at least as large at the top as at the bottom and large enough to provide 4-inch clearance between the pole and side of the hole. Provide a 6-inch band of soil around and down to the base of the pole treated with 2 to 3 gallons of a 1 percent dursban TC termiticide solution.

B. Pole setting depths shall be as follows:

<u>Length of Pole (feet)</u>	<u>Setting in Soil (feet)</u>	<u>Setting in Solid Rock (feet)</u>
20	5.0	3.0
25	5.5	3.5
30	5.5	3.5
35	6.0	4.0
40	6.0	4.0
45	6.5	4.5
50	7.0	4.5
55	7.5	5.0
60	8.0	5.0

C. "Setting in Soil" depths, as specified in paragraph entitled, "Setting Depth of Pole," apply where the following occurs:

1. Where pole holes are in soil, sand, or gravel or any combination of these.
2. Where soil layer over solid rock is more than 2 feet deep.
3. Where hole in solid rock is not substantially vertical.
4. Where diameter of hole at surface of rock exceeds twice the diameter of pole at same level. At corners, dead ends and other points of extra strain, poles 40 feet or more long shall be set 6 inches deeper.

D. "Setting in Solid Rock," as specified in paragraph entitled "Setting Depth of Pole," applies where poles are to be set in solid rock and where hole is substantially vertical, approximately uniform in diameter, and large enough to permit use of tamping bars the full depth of the hole.

E. Where a layer of soil 2 feet or less in depth over solid rock exists, depth of hole shall be depth of soil in addition to depth specified under "Setting in Solid Rock" in paragraph entitled "Setting Depth of Pole," provided, however, that such depth shall not exceed depth specified under paragraph entitled "Setting in Soil."

F. On sloping ground, always measure hole depth from low side of hole.

G. Thoroughly tamp pole backfill for full depth of the hole and mound excess fill around the pole.

- H. Set poles so that alternate crossarm gains face in opposite directions, except at terminals and dead ends where gains of last two poles shall be on side facing terminal or dead end. On unusually long spans, set poles so that crossarm comes on side of pole away from long span. Where pole top pins are used, they shall be on opposite side of pole from gain, with flat side against pole.
- I. Set poles in alignment and plumb at corners, terminals, angels, junctions, or other points of strain, where they shall be set and raked against the strain. Set not less than 2 inches for each 10 feet of pole length above grade, nor more than 4 inches for each 10 feet of pole length after conductors are installed at required tension. When average ground run is level, consecutive poles shall not vary more than 5 feet in height. When ground is uneven, poles differing in length shall be kept to a minimum by locating poles to avoid the highest and lowest ground points. If it becomes necessary to shorten a pole, a piece shall be sawed off the top. Holes shall be dug large enough to permit the proper use of tampers to full depth of hole.
- J. Provide plastic pole caps with 1/4-inch sealing rings and four nailing tabs. Fill sealing area with either a bituminous, elastigum roof cement or an acceptable preservative paste to level of sealing ring to eliminate possibility of condensation. Place on pole top and nail each tab down with a 1 1/4-inch nail. Pole caps are not necessary for ACA/CCA treated poles.
- K. Place anchors in line with strain. The length of the guy lead (distance from base of pole to the top of the anchor rod shall be as indicated.
- L. Set anchors in place with anchor rod aligned with, and pointing directly at, guy attachment on the pole with the anchor rod projecting 6 to 9 inches out of ground to prevent burial of rod eye.
- M. Backfill patent, plate, expanding, concrete, or cone type anchors with tightly tamped coarse rock 2 feet immediately above anchor and then with tightly tamped earth filling remainder of hole. Backfill plate anchors with tightly tamped earth for full depth of hole.
- N. Install screw anchors by torquing with boring machine. Anchor rod eye shall extend 6 to 9 inches above grade.
- O. Install swamp anchors by torquing with boring machine or wrenches, adding sections of pipe as required until anchor helix is fully engaged in firm soil.
- P. Complete anchor and guy installation, dead end to dead end, and tighten guy before wire stringing and sagging is begun on that line section. Provide strain insulators at a point on guy strand 8 feet minimum from the ground and 6 feet minimum from the surface of pole. Effectively ground and bond guys to system neutral. Guy strand shall be insulated or grounded in conformance with ANSI C2 or practice in the particular station.
- Q. Provide hardware with washer against wood and with nuts and locknuts applied wrench tight. Provide locknuts on threaded hardware connections. Locknuts shall be M-F style and not palnut style.
- R. Grounding shall conform to ANSI C2 except that each separate ground electrode shall have a resistance to solid earth not exceeding 5 ohms. When work in addition to that indicated or specified is directed in order to obtain specified ground resistance, provisions of the contract covering changes shall apply.

- S. Make ground rod connections on pole lines by exothermic weld or by using a compression connector for ground wire or wire to rod connections. Make exothermic welds strictly in accordance with manufacturer's written recommendations. Welds which have puffed up or which show convex surfaces indicating improper cleaning, are not acceptable. No mechanical connectors are required at exothermic weldments. Compression connectors shall be type that uses a hydraulic compression tool to provide correct pressure. Provide tools and dies recommended by compression connector manufacturer. An embossing die code or similar method shall provide visible indication that a connector has been fully compressed on ground wire.
- T. Ground noncurrent carrying metal parts of equipment or enclosures.
- U. Connect grounding terminal of each arrester to ground. Surge arrester grounding conductor shall be separate from the other grounding conductors.
- V. Primary and secondary neutrals and tank of each transformer shall be interconnected and connected to ground.
- W. Protect grounding conductors which are run on surface of wood poles by wood molding or plastic molding of equal mechanical strength extending from ground line throughout communication and transformer spaces.
- X. Conductors shall be handled with care necessary to prevent nicking, kinking, gouging, flattening, or otherwise deforming or weakening conductor or impairing its conductivity. Remove damaged sections of conductor and splice conductor.
- Y. Conductor splices, as installed, shall exceed ultimate rated strength of conductor and shall be of type recommended by conductor manufacturer. No splice shall be permitted within 10 feet of a support.
- Z. Provide ties on pin insulators tight against conductor and insulator ends turned down flat against conductor so that no wire ends project.
- AA. Existing conductors to be reinstalled or resagged shall be strung to "final" sag table values for the particular conductor type and size involved.
- BB. String new conductors to "initial" sag table values recommended by the manufacturer for conductor type and size of conductor and ruling span indicated.
- CC. Secure conduits on poles by two hole galvanized steel pipe straps spaced no more than 10 feet apart and within 3 feet of any outlet or termination. Ground metallic conduits.

3.02 FIELD QUALITY CONTROL

- A. As an exception to requirements that may be stated elsewhere in contract, the Contracting Officer shall be given five (5) working days notice prior to each test.
- B. Prior to connecting, test ground rods for ground resistance value. Use a portable ground testing megger to test each ground or group of grounds. Make ground resistance measurements in normally dry weather, not less than 48 hours after a rainfall. Follow the directions provided by the equipment manufacturer for proper use of the equipment.

- C. Perform visual and mechanical inspection and electrical test in accordance with NETA ATS and check transformer secondary voltages. Adjust voltage at the transformer to provide a secondary voltage of 120/240.
- D. Each device subject to manual operation shall be operated at least three times, demonstrating satisfactory operation each time.
- E. After installation of cable, splices, and terminators, and before terminating to equipment, perform a field acceptance test on cable systems in accordance with NETA ATS. Field acceptance test voltage for 15 kV cable shall be 35 kV for 15 minutes. If cable system fails to pass initial test, correct defects and perform subsequent acceptance tests until the work is in compliance with contract requirements. For underground cables, perform field acceptance test as specified in "Wires and Cables" and "Medium Voltage Cables."

END OF SECTION

SECTION 16452

GROUNDING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes grounding of electrical systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other sections of these Specifications.
 - 1. Extent of electrical grounding and bonding work is as indicated, specified herein, and as required by National Electrical Code. Grounding and bonding work is defined to encompass systems, circuits, equipment, and building structures and components.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for ground rods, connectors and connection materials, grounding fittings, and wires and cables.
- C. Test data forms.

1.04 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled. The terms "listed" and "labeled" shall be defined as they are in the National Electrical Code, Article 100.
- B. Electrical Component Standard: Components and installation shall comply with NFPA 70, "National Electrical Code" (NEC).
- C. UL Standard: Comply with UL 467, "Grounding and Bonding Equipment."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
1. Burndy Corporation.
 2. Cadwell Division, Erico Products Incorporation.
 3. O-Z/Gedney Company.

2.02 GROUNDING AND BONDING PRODUCTS

- A. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.
- B. Conductor Materials: Copper.

2.03 WIRE AND CABLE CONDUCTORS

- A. General: Comply with Division 16 Section "WIRES AND CABLES." Conform to NEC, except as otherwise indicated, for conductor properties, including stranding.
- B. Equipment Grounding Conductor: Green insulation, copper conductor.
- C. Isolated Grounding Conductor: Green with yellow tracer/band insulation, copper conductor.
- D. Grounding Electrode Conductor: Bare stranded copper conductor.
- E. Bare Copper Conductors: Conform to the following:
1. Solid Conductors: ASTM B 3.
 2. Assembly of Stranded Conductors: ASTM B 8.
- F. Ground Bus: Bare annealed silver plated copper bars of rectangular cross section, sizes based upon 1,000 ampere per square inch.

2.04 CONNECTOR PRODUCTS

- A. General: Listed and labeled as grounding connectors for the materials used.
- B. Pressure Connectors: High-conductivity tin plated units.
- C. Bolted Clamps: Heavy-duty, high-conductivity copper units listed for the application.
- D. Exothermic Welded Connections: Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

2.05 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel with high-strength steel core and electrolytic-grade copper outer sheath, molten welded to core.
 - 1. Size: 1/2 inch by 8 feet unless indicated otherwise.

PART 3 – EXECUTION

3.01 APPLICATION

- A. Equipment Grounding Conductor Application: Comply with NEC for sizes and quantities of equipment grounding conductors, except where larger sizes and more conductors are indicated.
 - 1. Provide insulated equipment grounding conductors in all raceways, boxes, and associated equipment.
 - 2. Provide separate insulated equipment grounding conductor for each neutral conductor.
 - 3. In addition to the insulated equipment grounding conductor, provide an insulated isolated grounding conductor for isolated ground panelboards, switchboards, outlets and equipment.
- B. Underground Conductors: Bare, stranded copper except as otherwise indicated.
- C. Signal and Communications: For telephone, data, signal, and communication systems, provide a #6 AWG minimum green insulated copper conductor in PVC raceway from the grounding electrode system to each terminal board, terminal cabinet, central equipment location, and/or customer interface cabinet.
- D. Separately derived systems required by NEC to be grounded shall be grounded in accordance with NEC.
- E. Metal Poles Supporting Outdoor Lighting Fixtures: Ground pole to an individual ground rod using #1/0 soft drawn bare copper ground conductor electrode in addition to separate equipment grounding conductor run with supply branch circuit.

3.02 INSTALLATION

- A. General: Ground electrical systems and equipment in accordance with NEC requirements except where the Drawings or Specifications exceed NEC requirements.
- B. Ground Rods: Locate a minimum of 1 rod length from each other and at least the same distance from any other grounding electrode. Interconnect ground rods with bare conductors buried at least 24 inches below grade. Connect bare-cable ground conductors to ground rods by means of exothermic welds except as otherwise indicated. Make these connections without damaging the copper coating or exposing the steel. Use 1/2 inch by 8 feet ground rods. Drive rods until tops are 6 inches below finished floor or final grade except as otherwise indicated. Initially install 1 ground rod. Test for resistance to earth using equipment specifically designed for such testing employing the 3 point method. If resistance is greater than 10 OHMS install 2 additional ground rods, and bare stranded soft drawn copper. Install the ground rods in a

triangular pattern with a spacing of 10 feet between rods. Install ground rod(s) on exterior side of building if length of bare stranded soft drawn copper to ground rod does not exceed 20 feet.

- C. **Metallic Water Service Pipe:** Provide copper ground conductors, from the building main service equipment ground bus to main metallic water service entrances to the building. Connect ground conductors to the main metallic water service pipes by means of ground clamps. Where a dielectric main water fitting is installed, connect the ground conductor to the street side of the fitting. Do not install a grounding jumper around dielectric fittings.
- D. Install bonding jumper and ground clamps on water meter piping to bypass water meters electrically.
- E. Route grounding conductors along the shortest and straightest paths possible without obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- F. Bond interior metal piping systems and metal air ducts to equipment ground conductors of pumps, fans, electric heaters, and air cleaners serving individual systems.

3.03 CONNECTIONS

- A. **General:** Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to assure high conductivity and make contact points closer in order of galvanic series.
 - 2. Make connections with clean bare metal at points of contact.
 - 3. Coat and seal connections involving dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. **Exothermic Welded Connections:** Use for connections to structural steel, underground connections, and connections to ground rods except as indicated otherwise. Comply with manufacturer's written recommendations. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. **Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs.** Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors.
- D. **Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts.** Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A and UL 486B.
- E. **Compression-Type Connections:** Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors.
- F. **Mechanical Type Connections:** Split-bolt type connectors shall not be provided.

- G. Moisture Protection: Where insulated ground conductors are connected to ground rods or ground buses, insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

3.04 FIELD QUALITY CONTROL

- A. Independent Testing Organization: Arrange and pay for the services of a qualified certified independent electrical testing organization to perform tests.
- B. Tests: Subject the individual ground rods and the completed grounding electrode system to a ground resistance test at each location. Measure ground resistance without the soil being moistened by any means other than natural precipitation or natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the 3 point method in accordance with Section 9.03 of IEEE 81, "Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System." Natural precipitation shall not have occurred within 24 hours of the test.
- C. Ground/resistance maximum values shall be as follows:
 - 1. Ground Rod(s): 10 Ohms.
 - 2. Completed grounding electrode system: 5 Ohms.
- D. Deficiencies: Where ground resistance exceeds specified values modify the grounding system to reduce resistance values to acceptable levels.
- E. Report: Prepare test reports of the ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results. Provide copy of test(s) data to the Contracting Officer.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16470

PANELBOARDS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V or less.
- B. Related Sections include the following:
 - 1. Division 16 Section "Basic Electrical Materials and Methods" for general materials and installation methods.
 - 2. Division 16 Section "Electrical Identification" for labeling materials.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type panelboard, accessory item, and component specified.
- C. Shop drawings from manufacturers of panelboards including dimensioned plans, sections, and elevations. Show tabulations of installed devices, features, accessories, current rating, and voltage rating. Include the following:
 - 1. Enclosure type with details for types other than NEMA Type 1.
 - 2. Bus configuration and current ratings.
 - 3. Short-circuit current rating of panelboard and protective devices.
 - 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
 - 5. Time-current data curves for protective devices.
- D. Wiring diagrams detailing schematic diagram including control wiring, and differentiating between manufacturer-installed and field-installed wiring.
- E. Panel schedules for installation in panelboards. Submit final versions after load balancing.

- F. Maintenance data for panelboard components, for inclusion in Operating and Maintenance Manual specified in Division 1 and in Division 16 Section "Basic Electrical Requirements." Include instructions for testing circuit breakers.
- G. Test data forms.

1.04 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The terms "listed" and "labeled" shall be defined as they are in the National Electrical Code, Article 100.
- B. Electrical Component Standard: Components and installation shall comply with NFPA 70, "National Electrical Code."
- C. NEMA Standard: Comply with NEMA PB1, "Panelboards."
- D. UL Standards: Comply with UL 61, "Panelboards," and UL 50, "Cabinets and Boxes."

1.05 EXTRA MATERIALS

- A. Keys: Furnish 6 spares for panelboard cabinet locks where applicable.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:
 - 1. Cutler Hammer/Westinghouse, Eaton Corporation.
 - 2. ITE, Siemens Energy & Automation, Incorporated.
 - 3. Square D Company.

2.02 PANELBOARDS, GENERAL REQUIREMENTS

- A. Provide panelboards and auxiliary components of types, sizes, and ratings indicated and that comply with manufacturer's standard materials, design, and construction in accordance with published product information, unless indicated otherwise. Series rated devices, equipment and assemblies shall not be provided. IEC rated devices, equipment and assemblies shall not be provided. All rated devices, equipment, and assemblies shall be NEMA rated. All buses shall be plated copper and based upon 1,000 ampere per square inch. All connections shall be tightly bolted. AIC shall be 10,000 AIC unless indicated otherwise.

- B. Provide dead-front safety type circuit breaker panelboards as indicated, with bolt-on to bus molded case circuit breakers in quantities, ratings, types and arrangement indicated. Provide anti-turn solderless pressure type lug connectors approved for copper conductors on all circuit breakers and bus bars. All connectors shall be listed for 75 degrees C. All bus bars shall be hard drawn silver plated copper of 98 percent conductivity. Provide full size neutral bus. Provide ground bus. If for service entrance and rated greater than 200 ampere provide a main bonding jumper per NEC 250-53b and 250-79 between the neutral bus and the ground bus. Provide circuit breakers with toggle handles that indicate when tripped. Provide common trip on multiple pole circuit breakers so overload on one pole will trip all poles simultaneously. Provide 20 ampere, single pole circuit breakers listed as type SWD. Provide circuit breakers listed as type HCAR as required. Select enclosures and front trims fabricated by same manufacturer as panelboard and that mate properly with panelboards.
- C. Provide panelboard enclosures fabricated of code-gauge, minimum 16-gauge thickness, galvanized sheet steel unless required to be of other type of material to meet NEMA type as indicated. Provide enclosures with knock-outs. Provide front trims with adjustable trim clamps and hinged door with flush key lock. All locks shall be keyed alike. Provide 6 extra keys. Provide front with interior circuit directory frame and directory card with clear plastic cover.

2.03 IDENTIFICATION

- A. General: Refer to Division 16 Section "ELECTRICAL IDENTIFICATION" for labeling materials.

2.04 LOAD CENTERS

- A. Overcurrent protective devices shall be plug-in, full-module circuit breaker.
 - 1. Circuit breakers for switching lights at panelboards shall be indicated as Type SWD.
 - 2. Circuit breakers for equipment marked Type HACR shall be indicated as Type HACR.
- B. Conductor connectors shall be mechanical type for main, neutral, and ground lugs and buses.
- C. All bus bars shall be copper.
- D. Load centers door shall use a standard, non-lockable latch as supplied by particular manufacturer.
- E. Except as modified above, all other general requirements for panelboards shall apply to load centers.

PART 3 – PART 3 EXECUTION

3.01 INSTALLATION

- A. General: Install panelboards or load centers and accessory items in accordance with NEMA PB 1.1, "General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less" and manufacturer's written installation instructions.
- B. For residential installation, load centers shall be used.

- C. Mounting Heights: Top of box 6'-0" above finished floor, except as indicated.
- D. Mounting: Plumb and rigid without distortion of box. Mount flush panels uniformly flush with wall finish. Mount surface panels on U-channels in accordance with Division 16 Section "SUPPORTING DEVICES."
- E. Install surface-mounted load center on a 4' x 4' x 3/4" thick plywood backboard.
- F. Circuit Directory: Typed and reflective of final circuit changes required to balance panel loads. Obtain approval prior to typing and installing.
- G. Install filler plates in unused spaces.
- H. Appropriate connectors shall be used for the installation of nonmetallic sheathed cable in the knockouts of the panel board or load center.

3.02 IDENTIFICATION

- A. Identify field-installed wiring and components and provide warning signs in accordance with Division 16 Section "ELECTRICAL IDENTIFICATION."

3.03 GROUNDING

- A. Connections: Make equipment grounding connection(s) for panelboards unless indicated otherwise.
- B. Provide ground continuity to main electrical ground bus(es) unless indicated otherwise.

3.04 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, in accordance with manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.05 FIELD QUALITY CONTROL

- A. Quality Control Program: Conform to the following:
 - 1. Procedures: Make field tests and inspections and prepare panelboard for satisfactory operation in accordance with manufacturer's recommendations and these specifications.
- B. Visual and Mechanical Inspection: Include the following inspections and related work:
 - 1. Inspect for defects and physical damage, labeling, and nameplate compliance with requirements of drawings and panelboard schedules.
 - 2. Exercise and perform operational tests of all mechanical components and other operable devices in accordance with manufacturer's instruction manual.
 - 3. Check panelboard mounting, area clearances, and alignment and fit of components.

4. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
 5. Check circuit location within panelboard for compliance with panel schedule to ensure balance loads. Make necessary corrections when not in compliance with panel schedule.
- C. Electrical tests: Include the following items performed in accordance with manufacturer's instruction:
1. Test panelboard with 1000 VDC megger. Test each phase bus to each phase bus, neutral bus, and ground bus. Test neutral bus to ground bus. Record data on test forms. Provide test data as requested by the Contracting Officer for review by the Contracting Officer. Any equipment failing to meet minimum standards as determined by the Contracting Officer shall be replaced or repaired at Contractor's expense. Provide written notice of test date/time to Contracting Officer a minimum of 48 hours prior to the test date.
- D. Provide a written statement to the Contracting Officer that confirms all field quality control work has been performed and that all installations meet the requirement of the contract documents.

3.06 CLEANING

- A. Upon completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16512

EXTERIOR LIGHTING FIXTURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. Extent of exterior lighting fixture work is indicated by drawings and schedules and as specified here-in.
- B. Poles and standards required for use in conjunction with exterior lighting fixtures, lamp, are specified in Division 16 Section, "POLES AND STANDARDS."

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions on each type exterior building lighting fixture and component.
- B. Shop Drawings: Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in "luminary type" alphabetical or numerical order, with proposed fixture, lamp, and accessories clearly indicated on each sheet.
- C. Illumination Data: Provide isofootcandle (isolux) plot diagram of footcandles which shows composite values of illuminance projected from the arrangement of light sources from indicated fixture locations and heights. Show on the graphic plots the locations, spacings and heights of luminaries.
- D. Sample: Submit one (1) sample light fixture for each exterior light fixture type specified. The sample shall be a fully functional fixture, complete with lamp, and the exact product that will be used on the project. Upon review and approval of the fixture, including the approval of any other submittals required for that fixture as may be described here-in, the fixture shall be made available for use by the contractor on this project.

1.04 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of exterior building lighting fixtures of types and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Firm with at least 3 years of successful installation experience on projects with exterior lighting fixture work similar to that required for project.
- C. Codes and Standards:
 - 1. Code Compliance: Comply with applicable code requirements of the authority having jurisdiction and NEC.
 - 2. NEMA Compliance: Comply with applicable requirements of NEMA Standards Publication Number LE 2 pertaining lighting equipment.
 - 3. IES Compliance: Comply with IES lighting practices.
 - 4. UL Compliance: Comply with requirements of UL standards, including Stds 486A and B, pertaining to exterior lighting fixtures. Provide exterior lighting fixtures and components which are UL listed and labeled.
 - 5. NFPA Compliance: Comply with applicable requirements of NFPA 78, "Lightning Protection Code," pertaining to installation of exterior lighting fixtures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver exterior lighting fixtures in factory-fabricated containers or wrappings, which properly protect fixtures from construction debris and physical damage.
- B. Store exterior lighting fixtures in original wrappings in a clean dry place. Protect from weather, dirt, fumes, water, construction debris, and damage.
- C. Handle exterior lighting fixtures carefully to prevent damage, breaking, and scoring. Do not install damaged fixtures or components; remove units from site and replace with new.

1.06 SEQUENCING AND SCHEDULING

- A. Coordinate to properly interface installation of exterior lighting fixtures with other work.
- B. Sequence exterior lighting installation to reduce possibility of damage and soiling of fixtures during remainder of construction period.

1.07 MAINTENANCE

- A. Maintenance Data: Submit maintenance data and parts list for each exterior lighting fixture and accessory; including "trouble-shooting" maintenance guide. Include that data, product data, and shop drawings in a maintenance manual; in accordance with requirements of Division 1, Section "CONTRACT CLOSEOUT."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one (for each similar type of exterior lighting fixture) of the manufacturers indicated.

2.02 EXTERIOR LIGHTING FIXTURES

- A. General: Provide lighting fixtures, of sizes, types and ratings indicated; complete with, but not limited to, housings, energy efficient ballasts, starters and wiring.
- B. Wiring: Provide electrical wiring within fixtures which are suitable for connection to branch circuit wiring as follows:
 - 1. NEC Type AF for 120 volts, minimum No. 18 AWG.
- C. High-Intensity-Discharge-Lamp Ballasts: Provide fused, high power-factor HID lamp ballasts, of ratings, types, and makes as recommended by lamp manufacturer, which properly mates and matches lamps to electrical supply by providing appropriate voltages and impedance's for which lamps are designed. Ballasts to operate lamp within the lamp's power trapezoid requirements.
- D. Lamps:
 - 1. Provide lamps as indicated.
 - 2. Provide lamps of one (for each similar type of lamp) of the following manufacturers, or equivalent:
 - a. General Electric Company.
 - b. Osram Sylvania Incorporated.
 - c. Phillips Lighting Company.
- E. Exterior Lighting Fixture Types:
 - 1. General: Various fixtures types are indicated. Fixtures shall comply with minimum requirements as indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which lighting fixtures are to be installed, and substrate which will support lighting fixtures. Notify Contracting Officer in writing of conditions detrimental to proper completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Contracting Officer.

3.02 INSTALLATION OF EXTERIOR LIGHTING FIXTURES

- A. Install exterior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation," NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.
- B. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B, and the National Electrical Code.
- C. Fasten electrical lighting fixtures and brackets securely to structural supports, including poles and standards; and ensure that installed fixtures are plum and level.

3.03 GROUNDING

- A. Provide equipment grounding connections for exterior lighting fixtures. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounds.

3.04 FIELD QUALITY CONTROL

- A. Replace defective fixtures for a period of one year following the Date of Substantial Completion.
- B. Replace defective or burned out lamps at the Date of Substantial Completion.
- C. All exterior lighting fixtures, where used for temporary lighting prior to Date of Substantial Completion, shall have new lamps installed.

3.05 ADJUSTING AND CLEANING

- A. Pre-aim adjustable lighting fixtures and lamps per manufacturers recommendation.
- B. Re-aim as required adjustable lighting fixtures and lamps in night test of system. Verify that measured illuminance values comply with isolux plot diagram values. Provide written notice of night test date/time to Contracting Officer a minimum of 48 hours prior to the test date. Provide measured values and projected values on the same plot diagram(s) to the Contracting Officer.
- C. Clean lighting fixtures of dirt and debris upon completion of installation. Clean fingerprints and smudges from lenses, reflectors, and lamps. Use methods and materials as recommended by manufacturer. Touch up scratches and mars of finish to match original finish.
- D. Protect installed fixtures from damage during construction period.

3.06 DEMONSTRATION

- A. Upon completion of installation of exterior lighting fixtures, and associated electrical supply circuitry, apply electrical energy to circuitry to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

END OF SECTION

This page was intentionally left blank for duplex printing.

SECTION 16515

INTERIOR LIGHTING FIXTURES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.
- B. Requirements specified in other Division 16 Sections apply to this Section.

1.02 SUMMARY

- A. Extent, location, and details of interior lighting fixture work is indicated by drawings and schedules, and as specified herein.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions on each type interior building lighting fixture and component.
- B. Shop Drawings: Submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in "luminaire type" alphabetical or numerical order, with proposed fixture, lamp, and accessories clearly indicated on each sheet. Submit details indicating compatibility with ceiling system.
- C. Sample: Submit one (1) sample light fixture for each exterior light fixture type specified. The sample shall be a fully functional fixture, complete with lamp, and the exact product that will be used on the project. Upon review and approval of the fixture, including the approval of any other submittals required for that fixture as may be described here-in, the fixture shall be made available for use by the contractor on this project.

1.04 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of interior lighting fixtures of sizes, types and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Firms with at least 3 years of successful installation experience on projects with interior lighting fixture work similar to that required for this project.

C. Codes and Standards:

1. Code Compliance: Comply with applicable code requirements of the authority having jurisdiction and NEC.
2. NEMA Compliance: Comply with applicable requirements of NEMA Standards Publication Numbers LE 1 and LE 2 pertaining to lighting equipment.
3. IES Compliance: Comply with IES lighting practices.
4. UL Compliance: Comply with UL standards, including UL 486A and B, pertaining to interior lighting fixtures. Provide interior lighting fixtures and components which are UL listed and labeled.
5. CBM Labels: Provide fluorescent lamp ballasts which comply with Certified Ballast Manufacturers Association standards and carry the CBM label.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver interior lighting fixtures in factory-fabricated containers or wrappings, which properly protect fixtures from damage.
- B. Store interior lighting fixtures in original packaging. Store inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, laid flat and blocked off ground.
- C. Handle interior lighting fixtures carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged units or components; replace with new.

1.06 SEQUENCING AND SCHEDULING

- A. Coordinate with other work to properly interface installation of interior lighting fixtures with other work.
- B. Sequence interior lighting installation with other work to minimize possibility of damage and soiling during remainder of construction.

1.07 MAINTENANCE

- A. Submit maintenance data and parts list for each interior lighting fixture and accessory; including "trouble-shooting" maintenance guide. Include that data, product data, and shop drawings in a maintenance manual; in accordance with general requirements of Division 1 Section "CONTRACT CLOSEOUT."

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one (for each similar type of interior lighting fixture) of the manufacturers indicated or approved equal.

2.02 INTERIOR LIGHTING FIXTURES

- A. General: Provide lighting fixtures, of sizes, types and ratings indicated; complete with, but not limited to, housings, lamp holders, reflectors, energy efficient ballasts, starters and wiring. Ship fixtures factory-assembled, with those components and parts required for a complete installation. Design fixtures with concealed hinges and catches, with metal parts grounded as common unit, and so constructed as to dampen ballast generated noise. Review architectural drawings and specifications to verify ceiling types, modules, suspension systems appropriate to installation.
- B. Wiring: Provide electrical wiring within fixture suitable for connecting to branch circuit wiring as follows:
 - 1. NEC Type AF for 120 volt, minimum No. 18 AWG.
- C. Fluorescent Lamp Ballasts: Provide fused high power factor low-energy fluorescent lamp ballasts, capable of operating lamp types indicated; with, rapid-start, and low-noise features; Type 1; Class P; sound-rated A. Provide 32 degree F. temperature type ballasts except provide 0 degree F. temperature type ballast for low temperature applications.
- D. High-Intensity-Discharge-Lamp Ballasts: Provide fused high power factor HID lamp ballasts, of ratings, types and makes as recommended by lamp manufacturer, which properly mates and matches lamps to electrical supply by providing appropriate voltages and impedance's for which lamps are designed.
- E. Lamps:
 - 1. Provide lamps as indicated.
 - 2. Provide lamps of one (for each similar type of lamp) of the following manufacturers:
 - a. General Electric Company.
 - b. Osram Sylvania Incorporated.
 - c. Phillips Lighting Company.
- F. Interior Lighting Fixture Types:
 - 1. General: Various fixture types are indicated. Fixtures shall comply with minimum requirements as indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which lighting fixtures are to be installed, and substrate for supporting lighting fixtures. Notify Contracting Officer in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Contracting Officer.

3.02 INSTALLATION OF INTERIOR LIGHTING FIXTURES

- A. Install interior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation," NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.
- B. Provide fixtures and fixture outlet boxes with hangers fasteners to support fixture weight. Fasten fixtures and fixture outlet boxes securely to structural members. Submit design of hangers and method of fastening for review by Contracting Officer. Where a future ceiling fan is indicated, a mounting box for this purpose shall be installed. The box shall be a 4" steel octagon box mounted on a 2" x 4" wood member spanning two (2) ceiling joists. Box and 2" x 4" wood shall be arranged so that the box properly and completely extends through the drywall ceiling.
- C. Install fixtures properly to eliminate light leakage between fixture and finished surface.
- D. Provide plaster frames for recessed fixtures installed in other than suspended grid type acoustical ceiling systems. Brace frames temporarily to prevent distortion during handling.
- E. Install pendant fixtures plumb and level. Provide individually mounted pendant fixtures longer than 2 feet with twin stem hangers. Provide stem hanger with ball aligners and provisions for minimum 1 inch vertical adjustment. Mount continuous rows of fixtures with an additional stem hanger greater than number of fixtures in the row. Equally and symmetrically space stem hangers.
- F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standards 486A and B, and the National Electrical Code.
- G. Support surface mounted fixtures greater than 2 feet in length at a point in addition to the outlet box fixture stud.
- H. Install non-stem mounted continuous row mounted fixtures on steel U-channel. Suspend U-channel with equally and symmetrically spaced hangers. Provide a minimum quantity of hangers equal to the number of fixtures in the row plus one.
- I. Install row mounted fixtures plumb, level, and straight.

3.03 FIELD QUALITY CONTROL

- A. Replace defective fixtures for a period of one year following the Date of Substantial Completion.
- B. Replace defective or burned out lamps at the Date of Substantial Completion.
- C. All interior lighting fixtures, where used for temporary lighting prior to Date of Substantial Completion, shall have a new lamp installed.

3.04 ADJUSTING AND CLEANING

- A. Clean interior lighting fixtures of dirt and construction debris upon completion of installation. Clean fingerprints and smudges from lenses, reflectors, and lamps. Use methods and materials as recommended by manufacturer. Touch up scratches and mars of finish to match original finish.
- B. Protect installed fixtures from damage during remainder of construction period.

3.05 GROUNDING

- A. Provide equipment grounding connections for interior lighting fixtures. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounds.

3.06 DEMONSTRATION

- A. Upon completion of installation of interior lighting fixtures, and after building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

SECTION 16515

INTERIOR LIGHTING FIXTURES

APPENDIX

THE FOLLOWING PAGES ARE COPIES OF CUTSHEETS OF THE LIGHTING FIXTURES THAT ARE DESCRIBED IN THE LIGHTING FIXTURE SCHEDULE. THESE SHEETS ARE FOR REFERENCE, TO SHOW THE STYLE AND QUALITY OF THE DESIRED SPECIFIED FIXTURES. ALL FIXTURES SUPPLIED MUST BE IN FULL COMPLIANCE WITH THE "BUY AMERICAN ACT." EVIDENCE OF COMPLIANCE MUST BE SUBMITTED WITH THE SHOP DRAWINGS. NON-COMPLIANCE WILL RESULT IN DISAPPROVAL OF THE FIXTURE.